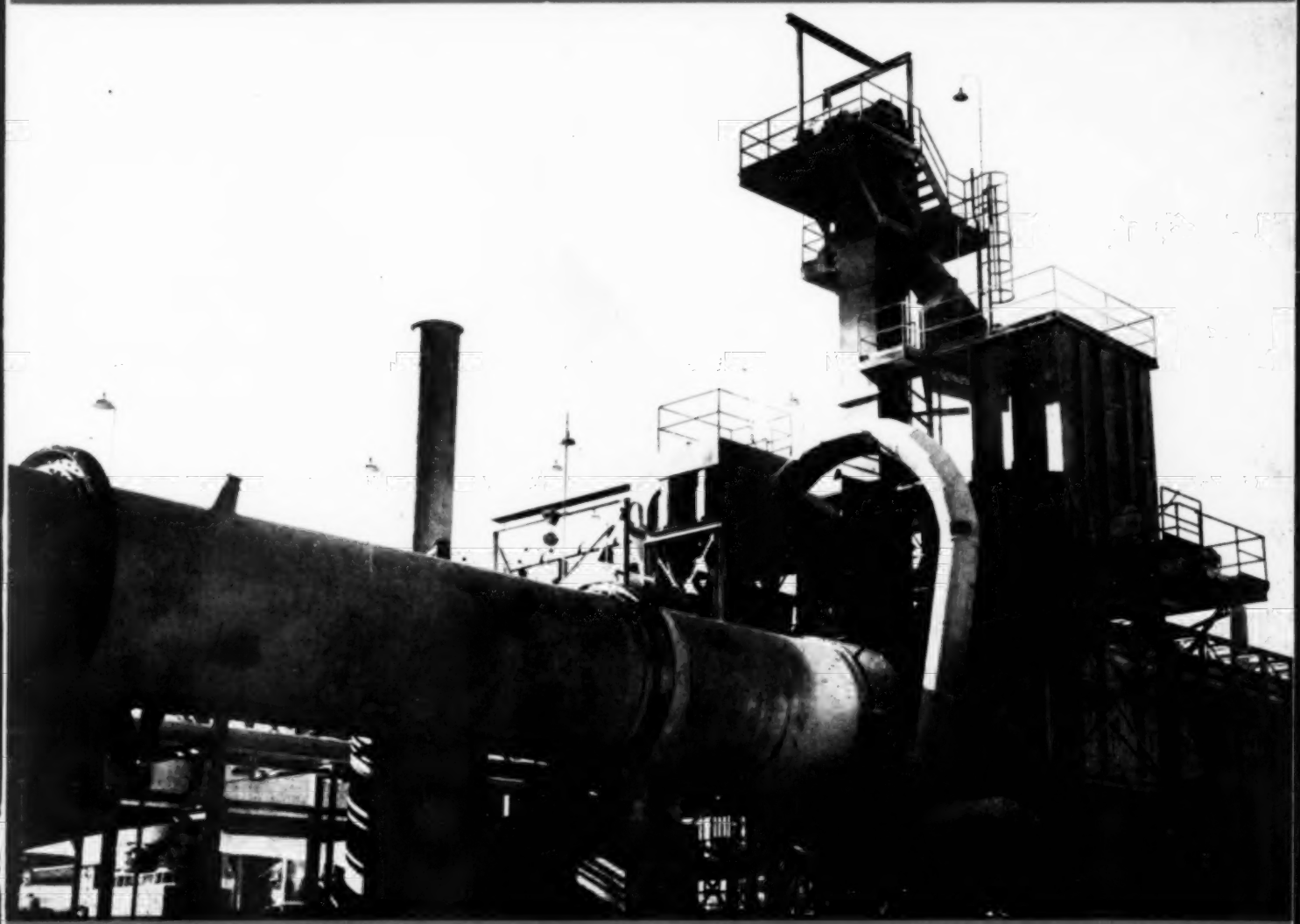
Vol. 8, No. 4 APRIL, 1953

AGRICULTURAL CHEMICALS



In This Issue:

NAC Association Meeting Report • Fertilizer Plant Housekeeping • Foreign Pesticide Use • Fertilizer Signs North Central ESA Meets • Fertilizer Supply for 1953 • Systemic Phosphorus Compounds • A.P.F.C. to Hot Springs New Miller Bill Introduced in Congress • NFA to White Sulphur • Grace Chemical to build $19 Million Plant in Memphis

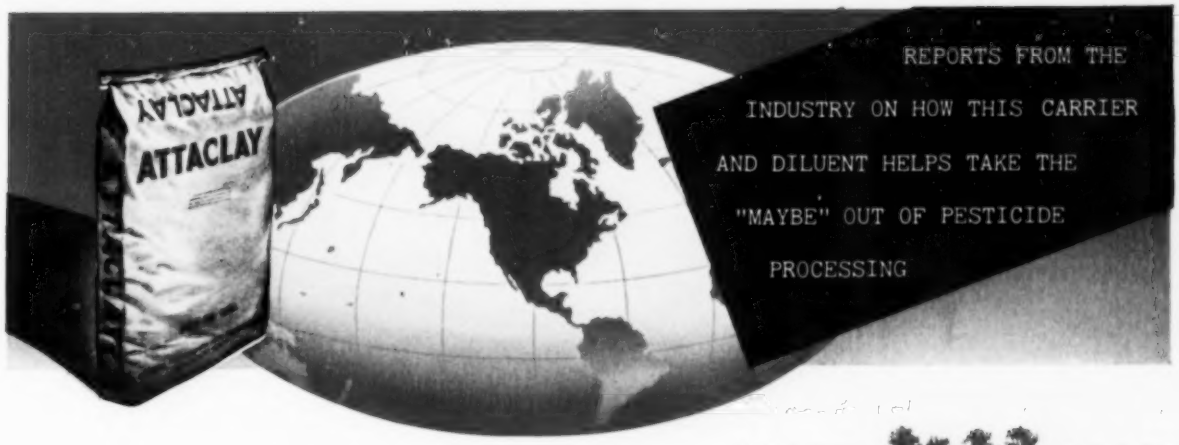
• *Population trends*

With more people moving from the farms to join their cousins in the cities, American agriculture is facing the necessity of growing more food with less manpower. A recent survey claims that by 1975 our food requirements will be 25% greater than at present.

Potash Company of America, a prime producer, is proud of its contribution in materials and service, in support of the fertilizer industry's aid to our growing farm economy.

POTASH COMPANY of AMERICA
Carlsbad, New Mexico

General Sales Office . . . 1625 Eye Street, N. W., Washington, D. C.
Midwestern Sales Office . . . First National Bank Bldg., Peoria, Ill.
Southern Sales Office . . . Candler Building, Atlanta, Ga.



Attaclay® delivers maximum flowability from formulation to field

OPERATION: Primary Processor's Plant on Gulf Coast.

PRODUCTION MANAGER: *Our product line contains nearly fifty dust base and wettable powder formulations utilizing solid and liquid toxicants. We've discovered that the best way to avoid the vexations of stickiness, heaviness and lumpiness, is to use Attaclay across the board. We depend on Attaclay to give us top output of dry, loose, premium-grade products.*

OPERATION: Finished Dust Blender's Plant in Mississippi.

OWNER: *First, we make every effort to start with Attaclay-mixed bases. Then we carry on from there by standardizing on Attaclay as diluent. As a result, we get fine end products that prove their own way to customer satisfaction by outstanding performance.*

OPERATION: Large-Scale Grower in Georgia.

FARM MANAGER: *One of our jobs is to analyze everything we use with a view to shaving unit costs and widening profit spread. That's why we know all about Attaclay—and why we're willing to pay a higher price for Attaclay-extended dusts. It is by far our cheapest way around many field application problems.*

ATTAPULGUS carriers for SOIL PESTICIDES

Granular grades have been developed which have formulating and field application characteristics of particular value in soil insect control. Like "thirsty" Attaclay, these commercially-proved granular grades have great sorptive capacity, insuring easy and effective processing. Excellent coverage results are obtained when applied either from the ground or the air. Particle size ranges to suit all formulations. Write for data sheet and free test samples.

Our suggestion: put Attaclay on your first team and forget flowability-dustability problems. May we work with you?

ATTAPULGUS Minerals & Chemicals Corporation

Dept. P, 210 West Washington Square, Phila. 5, Pa.

How do you measure the look in a puppy's eye?

The preliminary precautions have been taken. A well-recommended kennel. A healthy litter. A breed that takes well to youngsters.

Now it's up to the boy to choose.

How will he decide? Perhaps by the look in a puppy's eye.

Chances are, you'll be buying Multiwalls soon again. You've done as every good buyer does. You've considered the reputation of the various suppliers. You've investigated the quality of their product. You've set down your specifications to the last fraction.

Now you pause to think again of the fellow who will make the final choice—your customer. How will he decide? One consideration may well be "the look in a puppy's eye." To say it another way, the sales appeal of your package.

Men who know Multiwalls . . . who buy more than 85 per cent of all Multiwalls made . . . give great weight* to good printing and design.

Union's art directors have concentrated experience. They know how to give your Multiwall package the look it needs to stand out among competition. Volume purchasers of Multiwalls recognize this. They are calling on Union for a greater share of their Multiwall needs.

More so every day . . .

IT'S UNION FOR MULTIWALLS

TRADE MARK UNION

*August, 1951 research study.

UNION BAG & PAPER CORPORATION • WOOLWORTH BUILDING, NEW YORK 7

AGRICULTURAL CHEMICALS

THIS MONTH'S COVER

With fertilizer consumption in the U. S. on the increase, more and more producing units are coming into being in various parts of the country. Here is a photo of a dryer and calciner-carbonation plant of American Potash & Chemical Corporation at Trona, California.

VOL. 8 No. 4
APRIL 1953

A Monthly Magazine For the Trade

•

LAWRENCE A. LONG
Editor

JOHN A. NICHOLSON
Advertising Manager

•

Editorial Advisory Board . . .

DR. ALVIN J. COX
Palo Alto, Calif.

LEA S. HITCHNER
Washington, D. C.

DR. S. E. A. MCCALLAN
Yonkers, N. Y.

DR. CHARLES E. PALM
Ithaca, N. Y.

DR. COLIN W. WHITTAKER
Washington, D. C.

MEMBER AUDIT BUREAU OF CIRCULATIONS

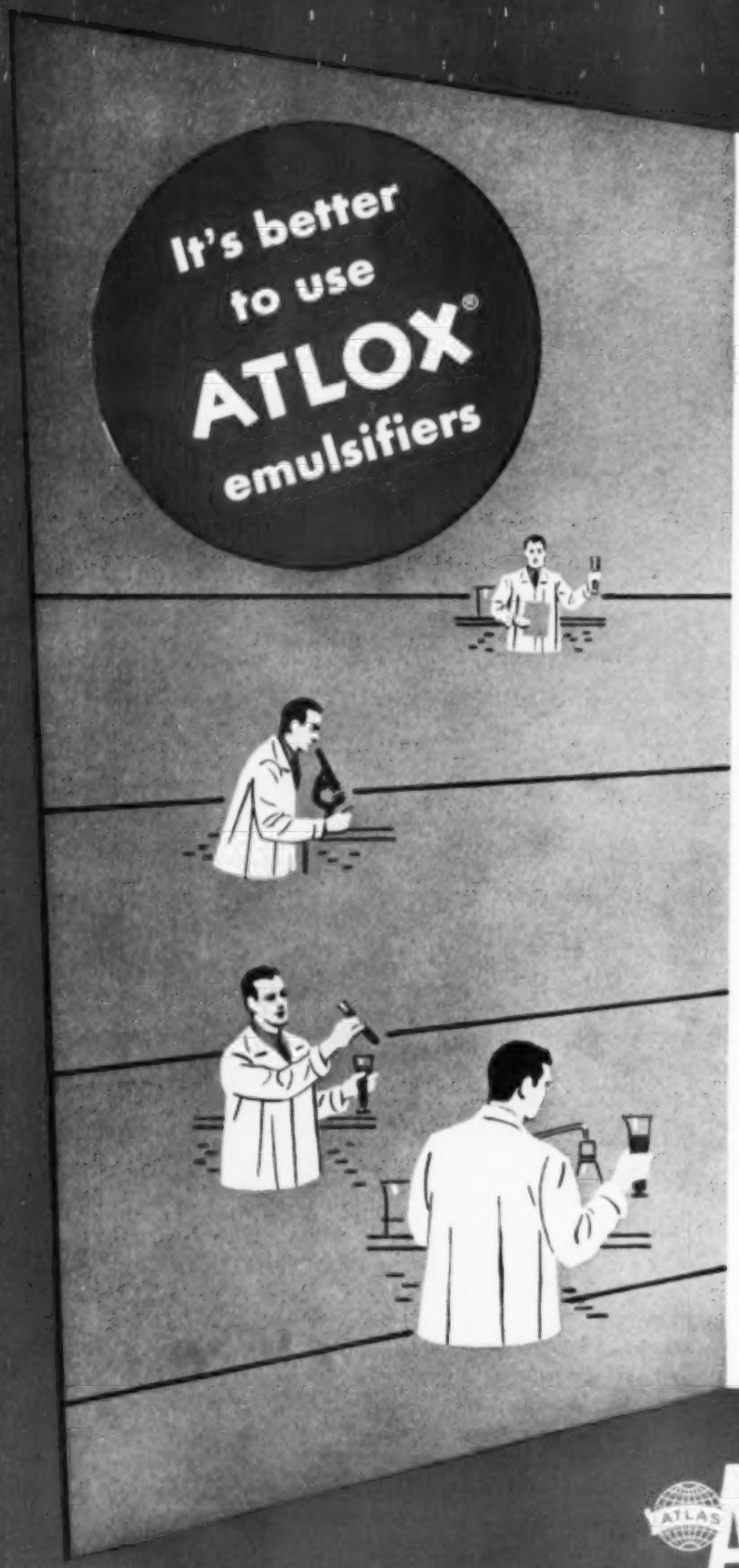
In This Issue:

Editorials 29
NAC Association in New Orleans Meeting 30
Good Housekeeping in Fertilizer Plants 35
By E. O. Burroughs, Jr.
Foreign Pesticide Use 37
By Charles E. Palm
Fertilizer Sign Language 40
By Lloyd Dumenil
North Central Branch, ESA, Meets 42
Fertilizer Supply Picture, 1953 45
Washington Report 46
Systemic Action of Phosphorus Compounds 47
By E. E. Ivy
American Plant Food Council to Meet 55
New Miller Bill Introduced 57
ACS in Western Meeting 59
Suppliers' Bulletins 63
Technical Briefs 65
Industry News 83
Southern Fertilizer Safety Meeting 103
Industry Meeting Calendar 109
Classified Advertising 145
Advertisers' Index 149
Tale Ends 150

AGRICULTURAL CHEMICALS

Subscription Rates: *One year, United States,* $3.00; *Canada and Pan American countries,* $4.00; *Foreign,* $7.00. *Published monthly on the 15th by Industry Publications, Inc. Wayne E. Dorland, President; Ira P. MacNair, Secretary-Treasurer. Publication office, 123 Market Place, Baltimore 2, Md. Advertising and editorial office 175 Fifth Ave., New York 10, New York — Chicago Office, 333 N. Michigan Blvd. Advertising rates made known on application. Closing date for copy— 15th of the month previous to date of issue.*

Entered as second-class matter November 4, 1949, at the Post Office at Baltimore, Md., under the Act of March 3, 1879.



they lead all others...

There are good reasons why Atlox emulsifiers lead in usage . . . why major formulators prefer them to any other kind.

Atlox emulsifiers lead in:

VERSATILITY

The broad selection of Atlox types offers a means for producing any formula . . . for insecticides, herbicides, oil sprays or wettable powders . . . for use in knapsack, low-gallonage, high-gallonage or other equipment.

STABILITY

Atlox emulsifiers are stable, virtually inert chemicals . . . produce concentrates with excellent shelf life. (Concentrates of a wide variety of toxicants, made with Atlox, show no break-down after 3 years' storage in glass!) What's more, these emulsifiers can be used to make concentrates that are extremely stable against separation during long periods of storage over wide temperature ranges.

TECHNICAL SERVICE

Atlas specialists can give you service-tested, practical assistance in developing formulas . . . for all presently used materials, and for new materials as soon as they appear on the market.

Write or call today for detailed literature or for technical assistance.

Your Headquarters for Surfactants . . .

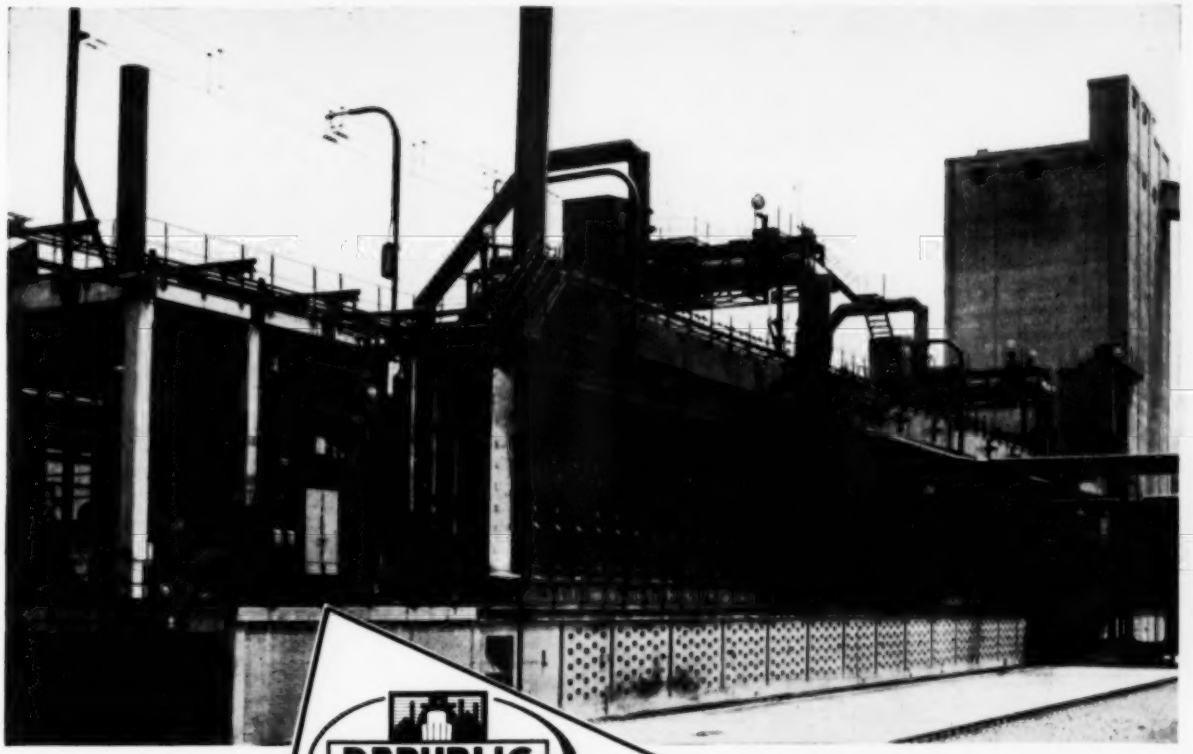
INDUSTRIAL CHEMICALS DEPARTMENT

ATLAS POWDER COMPANY

WILMINGTON 99, DELAWARE

offices in principal cities

ATLAS POWDER COMPANY, CANADA, LTD.
BRANTFORD, CANADA



More than $450,000,000 has been invested by Republic Steel in new steel-making plants and equipment, including modern coke ovens and coal chemical plants such as this.

REPUBLIC STEEL

Republic Steel's expansion program provides even more top-analysis AMMONIUM SULPHATE

Additional blast furnace capacity at Republic Steel required the construction of new, modern coke ovens. And added coke-oven capacity means that you now can get even more top-quality Ammonium Sulphate from Republic.

This high-capacity source of Ammonium Sulphate for your blends and mixes of nitrogenous fertilizers is ready to ship promptly and at regular intervals to meet your needs. For information on Republic Ammonium Sulphate, contact or write to:

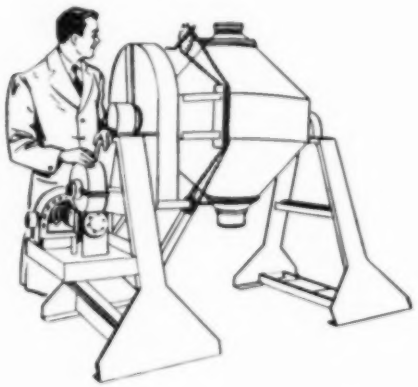
REPUBLIC STEEL CORPORATION
Coal Chemicals Division
REPUBLIC BUILDING • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

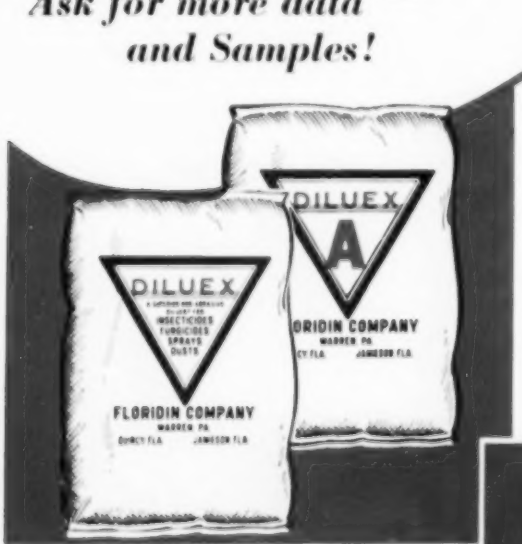
Republic REPUBLIC STEEL
AMMONIUM SULPHATE

DILUEX... makes MORE PESTICIDE SALES

Ask for more data and Samples!

Ease of handling, increased output, lowered cost, and an improved final product are the common experience of those who adopt DILUEX as the carrier and diluent in their pesticide formulations. Customer satisfaction and growing sales naturally follow. This is borne out very definitely in the records of recent years.





For impregnating liquid toxicants—milling DDT, BHC, or other organics—conditioning blended dusts—the total demand for DILUEX has multiplied during these years. Production facilities have been greatly enlarged to keep pace. Inquiries and orders will be given prompt attention.

FLORIDIN COMPANY

ADSORBENTS . . . DESICCANTS . . . DILUENTS

Dept. M, 220 Liberty Street, Warren, Pa.

Quality

...in all POWELL PRODUCTS

DDT INSECTICIDES

Dust Concentrates—Wettable Powders—Emulsions—Oil Soluble Concentrates

CHLORINATED INSECTICIDES

BHC, Lindane, Chlordane, Toxaphene---Dust Concentrates—Wettable Powders—Emulsions—Oil Soluble Concentrates

BOTANICALS

Pyrethrum, Rotenone, Sabadilla---Dust Concentrates—Emulsions—Oil Soluble Concentrates

RODENTICIDES

Antu—
J P 50 M (50% D D T tracking powder)

ORGANIC INSECTICIDES

Parathion, TEPP,
Allethrin, Aldrin, Dieldrin, Dilan, Heptachlor---Emulsion Concentrates—Dust Concentrates—Wettable Powders

ORGANIC WEED KILLERS

2, 4-D., 2, 4, 5-T---Acids, Salts, Emulsions, Oil Soluble Concentrates

SPECIALTY ITEMS

Aerosols
Custom made formulations—Grinding to meet specifications

The POWCO Brand label on any insecticide material is a guarantee of the highest, laboratory-controlled quality, backed by a quarter-century of development and experience. You can benefit by doing business with the *one* leading manufacturer and supplier of basic materials who does not compete with you.

John Powell & Co., Inc.

ONE PARK AVENUE, NEW YORK 16, N. Y.

Sales Offices: Philadelphia • Pittsburgh • Chicago • Huntsville • Fort Worth • Omaha • San Francisco • Atlanta

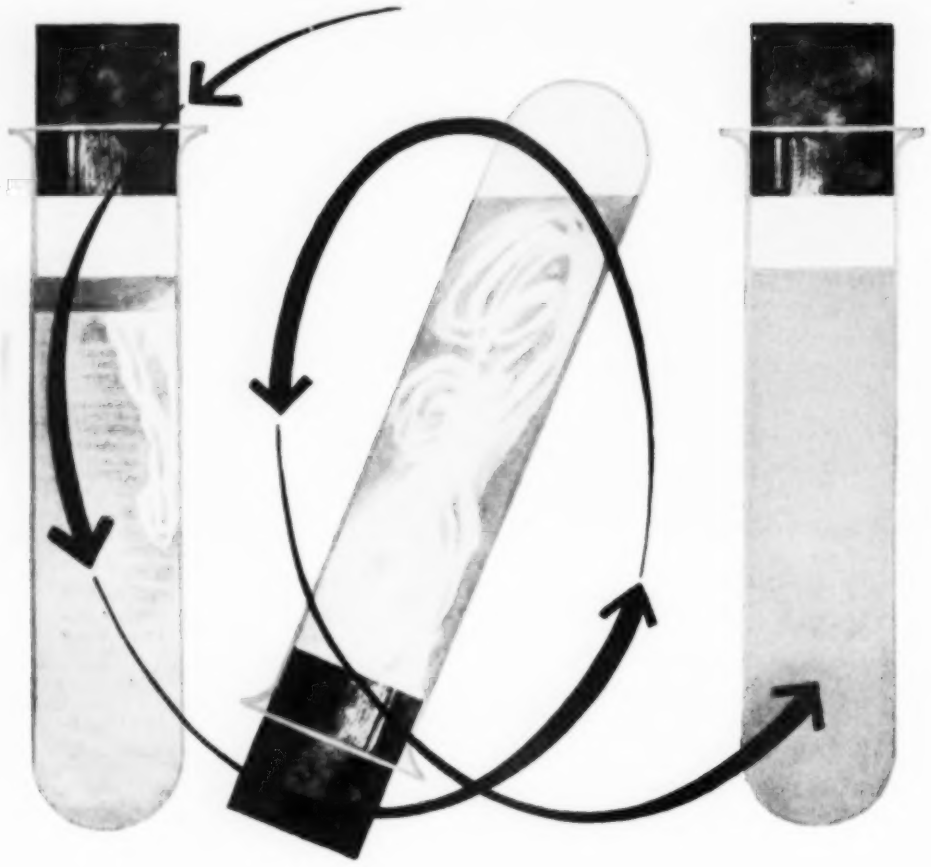
Representatives in Principal Cities of the World

POWCO TRADE MARK

KILLING POWER—THAT'S THE THING!

DDT • TOXAPHENE • BHC • CHLORDANE • LINDANE • ROTENONE • SABADILLA • PYRETHRUM & PYRIN • ANTU
PIPERONYL BUTOXIDE • ALLETHRIN • TEPP • PARATHION • ALDRIN • DILAN • HEPTACHLOR • 2, 4 D & 2, 4, 5 T

LOOK TO POWELL...FOR CONSISTENT, TROUBLE-FREE QUALITY



Stable emulsions this easy with ETHO-CHEMICALS®

Stable emulsions are formed with minimum agitation when you use Armour Etho-chemicals in your toxicant concentrates. These oil-soluble, water dispersible chemicals make possible rapid, long-lasting emulsions in extremely low concentrations, even in hard water! Here are a few examples. 2, 4-D isopropyl ester can be emulsified easily by combined low concentrations of two mildly cationic Ethomeens–S/12 and S/15. Another Etho-chemical–Ethofat 142/20–is an excellent non-ionic emulsifier for use with kerosene or xylol as a solvent. Ethofat 142/20 is so efficient that chlordane can be emulsified directly into water without the use of a solvent. Like the two Ethomeens, Ethofat 142/20 is not affected by water hardness.

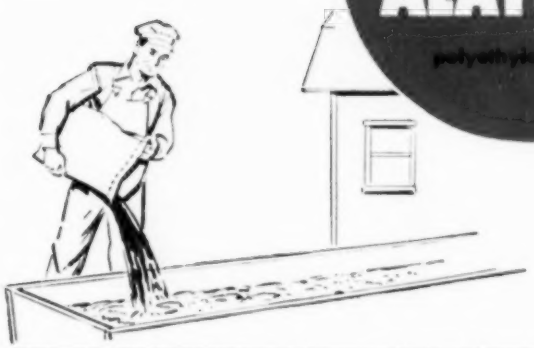
Toxaphene, DDT, chlordane, 2, 4-D–these are only a few of the toxicants that can be emulsified easily and economically with Etho-chemicals. Write today for complete information, including prices and suggested formulations, on our complete line of emulsifiers.

© ARMOUR AND COMPANY

ARMOUR CHEMICAL DIVISION

Armour and Company • 1355 West 31st Street • Chicago 9, Illinois

Bag keeps powdered molasses dry and free-flowing



It's coated with Du Pont ALATHON* polyethylene resin

Coating of "Alathon" insures moisture barrier to keep dry molasses from caking . . . provides bag with non-sticky walls

Developing a satisfactory multi-wall bag for powdered dry molasses involved solving two important problems. First, the bag had to be an effective moisture barrier . . . or the powder would cake. Second, the bag had to have a lining that the molasses would not stick to . . . or the particles would adhere to the surface and interfere with filling, sealing and emptying.

Both problems were solved when the packager of "Camola" molasses selected a three-ply bag with a coating of "Alathon" polyethylene resin on the inside. The coating of "Alathon" insures an extremely low rate of moisture-vapor transmission and serves as an effective moisture barrier. In addition, although the dry molasses sticks to the conventional packaging materials, it does not stick to "Alathon"—thus insuring greater ease of packaging and handling.

Perhaps "Alathon" polyethylene resin—with its unique combination of properties—can help you solve a special problem. "Alathon" is tough and flexible over a wide range of temperatures—from tropical heat to 70° below zero, resists most greases, acids and alkalies. Consider using it in multi-ply or single-ply bags, pouch bags, chipboard containers and trays, fiber drums and cartons.

*REG. U.S. PAT. OFF.

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
... THROUGH CHEMISTRY

Polychemicals
DEPARTMENT
PLASTICS • CHEMICALS

WRITE FOR FREE BOOKLET

describing the properties and uses of "Alathon" in the packaging field, or simply mail this handy coupon. We'll gladly put you in touch with sources of supply for packaging materials coated with "Alathon."

E. I. du Pont de Nemours & Co. (Inc.)
Polychemicals Dept. 554, Du Pont Bldg., Wilmington 98, Del.

Please send me the new booklet on packages using coatings of "Alathon."

Check type of package most interested in: Multi-wall bags ( ). Single-ply bags ( ). Pouch bags ( ). Fiber drums & cartons ( ). Chipboard containers & trays ( ). Overwraps ( ). Other ( ).

Name _____

Title _____

Company _____

Address _____

City _____ State _____

Use this check list to BUILD MORE INSECTICIDE BUSINESS

You can boost your sales this season—or any growing season—by helping your customers solve local insect problems.

Use this handy check list as a guide in recommending the proper insecticidal chemicals. Use the list also as a score sheet on sales potential—to be sure you are selling insecticides to control *all* the insects in the area you serve.

NIRAN* (Parathion—for agricultural use only)

For controlling:

Clover mite
Two-spotted spider mite
Pacific mite
Williamette mite
Strawberry spider mite
Citrus red mite
European red mite
Thrips
Leaf hoppers
Pear psylla
Aphids—many species
Mealy bug
Greenhouse whitefly
Scale insects (crawlers)
Blister beetles
Mexican bean beetle
Colorado potato beetle
Spotted cucumber beetle
Striped cucumber beetle
Flea beetles
Plum curculio
Cabbage worms
Corn earworm
Fall armyworm
Grape leaf folder
Beet webworm
Alfalfa webworm
Celery leaf tier
European corn borer
Codling moth
Grape berry moth
Eye-spotted bud moth
Strawberry leaf roller
Oriental fruit moth
Velvetbean caterpillar
. . . and other insects

NIFOS-T* (TEPP—for agricultural use only)

For controlling:

Two-spotted spider mite
Pacific mite
Citrus red mite
European red mite
Greenhouse thrips
Leaf hoppers
Pear psylla
Cotton or melon aphid
Cabbage aphid
Pea aphid
Green peach aphid
Strawberry aphid
Green bug aphid
Hop aphid
Apple aphid
Bean aphid
Citrus mealybug
Mexican mealybug
Greenhouse whitefly
Scale insects (crawlers)
Lace bugs
Tobacco suckfly
Mushroom flies
. . . and other insects

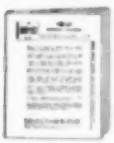
SANTOBANE*

(DDT)

For controlling:

Boll weevil
Corn earworm
Cotton flea hopper
Lygus bugs
Pink bollworm
Colorado potato beetle
Potato leaf hopper
Cabbage worm
Apple leaf hopper
Codling moth
Rose chafer
Japanese beetle
Peach tree borer
Oriental fruit moth
Gypsy moth
Cankerworm
Poultry lice
House fly
Mosquito
. . . and other insects

Reg. U. S. Pat. Off.



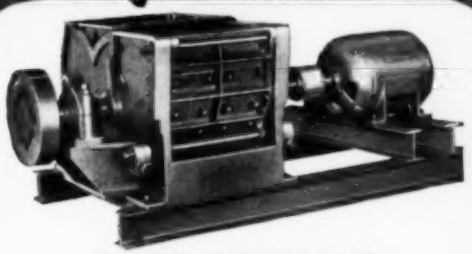
Send *for detailed information on properties and formulation of these insecticides. Ask for bulletins on Niran, Nifos-T, or DDT. Write:* MONSANTO CHEMICAL COMPANY, *Organic Chemicals Division, 800 North Twelfth Blvd., St. Louis 1, Mo.*

MONSANTO
CHEMICALS—PLASTICS
SERVING INDUSTRY . . . WHICH SERVES MANKIND

Crush It!
Grind It
Separate It

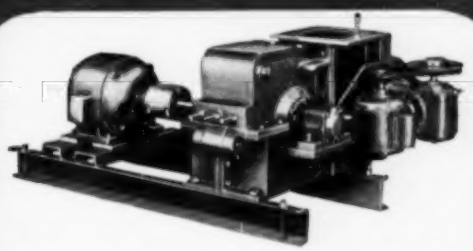
Do It Better, Faster And At Less Cost With...

WILLIAMS



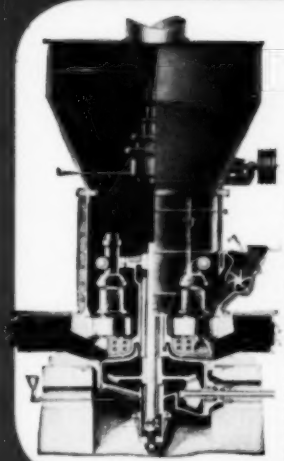
HAMMER MILLS

For heavy duty crushing or grinding of virtually any mineral or chemical — Williams builds them to do *a complete job in one operation!* Primary and secondary crushers are unnecessary — extra foundations, conveyors, other equipment are eliminated! You can save up to 75% on initial investment — up to 50% on grinding costs with the right Williams Hammer Mill!



HELIX-SEAL HAMMER MILLS

For cleaner, safer dustless grinding of dry materials — or non-clogging, accurate grinding of wet, sticky or greasy materials — to finenesses of 100 to 325 mesh. Combines the advantages of a hammer mill with closed-circuit screw-type feed. No separators, fans or cyclones required. Available with steam or water jackets. Low investment — inexpensive to install and operate.



ROLLER MILLS
WITH AIR SEPARATION

For accurate, uniform pulverizing or blending. Instantly adjustable to finenesses down to 400 mesh, even micron sizes. Dries and grinds simultaneously. Automatic, self-adjusting feed. Many other exclusive engineering and construction features. Williams Roller Mills have set new standards for product quality, output and economy.

OTHER WILLIAMS EQUIPMENT

- *IMPACT and DRIER MILLS*
- *AIR SEPARATORS*
- *VIBRATING SCREENS*
- *COMPLETE "Packaged" PLANTS For Installation In Existing Buildings*

At Your Service

WILLIAMS TESTING LABORATORY

Consult Williams on any grinding, crushing, shredding or separation problem, no matter what the material. The most complete testing and research facilities are available without cost or obligation. Simply furnish enough raw material for a test run, and a sample or description of the finished product desired.

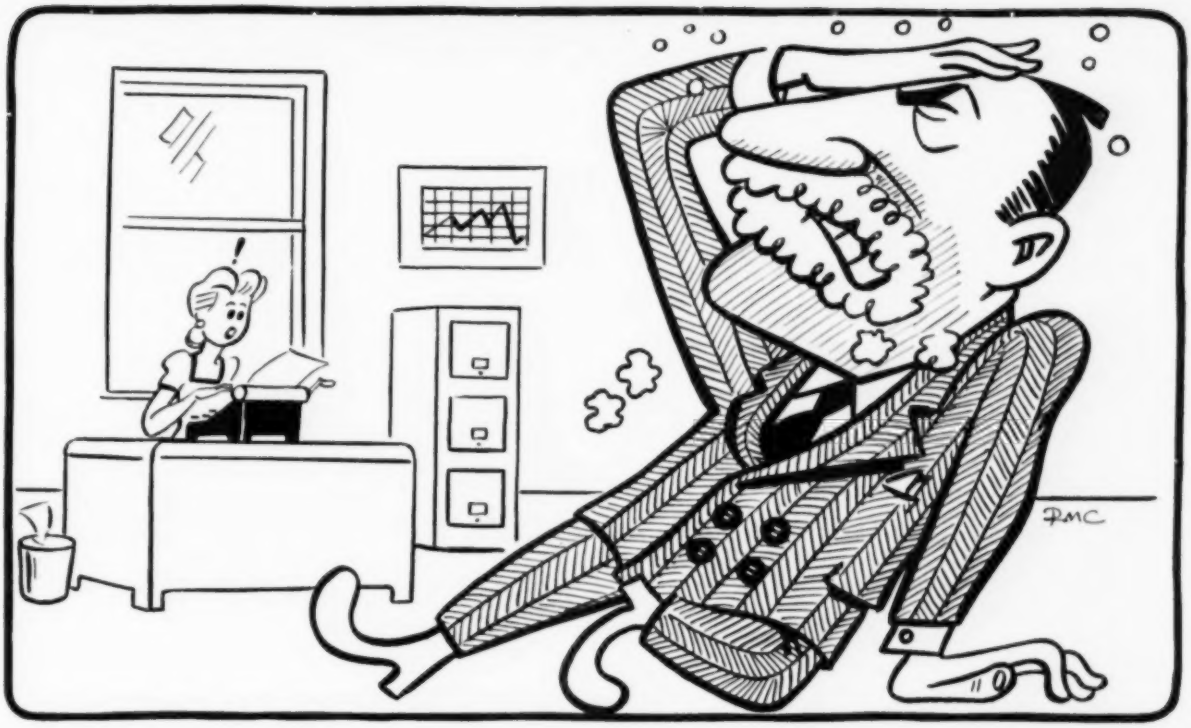
WILLIAMS PATENT CRUSHER & PULVERIZER CO.
2707 N. BROADWAY

WILLIAMS

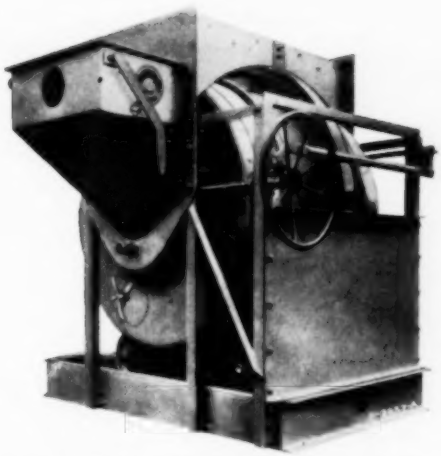
CRUSHERS — GRINDERS — SHREDDERS

OLDEST AND LARGEST MANUFACTURER OF HAMMER MILLS IN THE WORLD

CONTROL...
vital for pesticides
Laboratory Control—Formulation Control—Processing Control...
Insures Better Insect Control
with our
COMPLETE LINE OF PESTICIDES
ASHCRAFT-WILKINSON CO.
Home Office • Atlanta, Georgia
TOXAPHENE 40% • BHC • ALDRIN • PARATHION • DDT • SULPHURS • CHLORDANE • DIELDRIN
Norfolk, Va. • Charleston, S.C. • Tampa, Fla. • Jackson, Miss. • Columbus, Ohio



He can't stand that slow mixing cycle!



THE MODERN WORTHINGTON DRUM-TYPE FERTILIZER MIXERS are available in capacities of ½, 1, 2 and 3 tons.

But you don't have to go *that* far, chum. Give us a chance to help. We've got a mixer that can boost your daily output as much as 10%. It's the Worthington fertilizer mixer with an engineered blade design that gives the fastest mixing cycle we know of. You save time with every batch and can set up the mixer for continuous agitation. Mixing is thorough, too, and special mixer design eliminates these other big problems for you:

CORRODED DISCHARGE CHUTE—the Worthington discharge chute is out of the mixer during mixing time. Proper balance makes manual control of chute easy. Pneumatic controls are also available.

HARMFUL DUST SPREADING—the Worthington fertilizer mixer's charging and discharging chutes are designed for dustproof operation. A sealing disc attached to the discharge chute revolves with the drum to assure dustproof mixing.

HEAVY HORSEPOWER CONSUMPTION — Worthington's specially engineered anti-friction construction assures peak operating efficiency with lowest possible horsepower consumption.

YR 3.3

WORTHINGTON

Industrial Mixers

SEND THIS COUPON TODAY to learn more about how to reduce mixing time and cost with a Worthington fertilizer mixer. There's a skilled Worthington engineer near your plant. At your request, he'll be glad to call on you.

Worthington Corporation C
Industrial Mixer Division
Plainfield, New Jersey

Name .....

Position .....

Address .....

City ..... Zone ..... State .....

☐ I'd like more information. ☐ I'd like to talk with an engineer.

One-Stop NITROGEN Service For Fertilizer Manufacturers

LION

Nitrogen

FERTILIZER MATERIALS

LION ANHYDROUS AMMONIA—For formulation. A uniformly high-quality basic product. Nitrogen content, 82.25%.

LION AQUA AMMONIA—For formulation or acid oxidation. Ammonia content about 30%. Other grades to suit you.

LION AMMONIUM NITRATE FERTILIZER—For direct application or formulation. Improved spherical pellets. Guaranteed 33.5% nitrogen.

LION NITROGEN FERTILIZER SOLUTIONS—For formulation. Three types to suit varying weather and manufacturing conditions.

LION SULPHATE OF AMMONIA—For direct application or formulation. Large free-flowing crystals. Guaranteed nitrogen content, 21%.

TECHNICAL SERVICE—Lion provides special technical assistance for fertilizer manufacturers. Write to CHEMICAL SALES DIVISION for quick service.

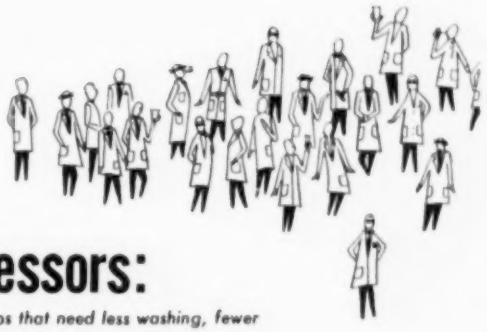
LION OIL COMPANY

EL DORADO, ARKANSAS

What TEPP* can do for

farmers:

Spray one day and harvest poison-free crops 48 hours later!



processors:

Cleaner crops that need less washing, fewer rejects due to last-minute infestations!

They all like remarkable TEPP—the pesticide that kills without leaving any lingering poisonous residue. When properly handled, TEPP can assure cleaner, higher quality crops that mean more profits for both farmer and processor.

Low cost, amazingly effective TEPP kills aphids, thrips, red spider mite, leafhopper nymphs, flea beetles and many other pests. TEPP is available 1) as a liquid concentrate, 2) as a stabilized dust, and 3) with other active ingredients. For quick kills and residue-free crops, specify TEPP formulations from your supplier. For the names of manufacturers of TEPP, write to Eastman Chemical Products, Inc., Chemicals Division, Kingsport, Tennessee.

TEPP*

means pest-free crops

poison-free crops

**Tetraethyl Pyrophosphate is made from triethyl phosphate—an Eastman chemical. TEPP is not supplied by Eastman Chemical Products, Inc.*

Eastman
CHEMICAL PRODUCTS, INC.
KINGSPORT, TENNESSEE

Sales representative for **TENNESSEE EASTMAN COMPANY,** division of **EASTMAN KODAK COMPANY**

think first of **DIAMOND**

for
insecticides
weed killers
brush killers

DIAMOND'S facilities for manufacturing and distributing agricultural chemicals for weed control, brush control and insect control assure formulator of pesticides a *dependable* source of supply for these important materials.

DIAMOND ALKALI COMPANY, long associated with high quality chemicals, is one of the world's largest manufacturers of basic herbicides and insecticides. The name DIAMOND itself is your automatic assurance of the best the market has to offer. Write for literature — and use our technical consulting service for your special problem. Your inquiries are welcome.

DIAMOND AGRICULTURAL CHEMICALS

DDT	100% Technical
LINDANE	99% Gamma Isomer of BHC
BHC	90% Technical
BHC	36% Technical
2,4-D and 2,4,5-T	Weed & Brush Killers Isopropyl Esters Butyl Esters Butoxy Ethoxy Propanol Esters (low volatile type)
K-101	Acaricide
HEXACHLORO-BENZENE	Seed Disinfectant

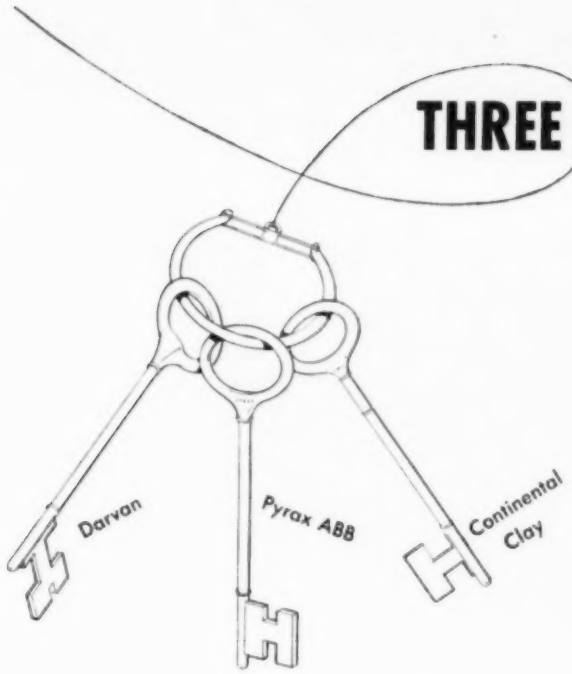
DIAMOND ALKALI COMPANY

Organic Chemicals Division

80 Lister Avenue • Newark 5, New Jersey

Plants: Newark, N. J. and Houston, Texas

DIAMOND ALKALI CHEMICALS



THREE keys for better dusts better sprays

NEW BULLETIN D23, just off the press, explains why Vanderbilt carriers, diluents and dispersing agents are your keys to more effective dusts and sprays. This bulletin will help you use these fine chemicals to improve the quality of your products.

Pyrax ABB

The most widely used Pyrophyllite in the agricultural field, Pyrax ABB is principally applied as a carrier for insecticides and fungicides. Pyrax ABB is also used in lesser quantities in seed protectants, weed control, defoliant dusts, and many other applications.

Pyrax ABB is nonhygroscopic. It may be stored from season to season because it does not affect the toxic strength of DDT, rotenone, pyrethrum, toxaphene, benzene hexachloride, the thiocarbamates, or the newer organic toxicants. Pyrax ABB is chemically inert — pH between 6.5 and 7.0. Free flowing, it mixes quickly and homogeneously giving a more even feed from the hopper, even with the newer waxy and oily toxicants. Pyrax ABB is extremely well adapted for aircraft dusting.

Non-drifting, Pyrax ABB produces a dense cloud that hugs the crop and adheres electrostatically — even to the dry underside of foliage — insuring less waste and permitting effective daytime dusting.

Increased plant capacity now assures an adequate supply of Pyrax ABB.

Darvan #1 and #2

Excellent dispersing and suspending agents for agricultural wettable concentrates. The unusual qualities of the Darvans maintain finely divided solids or liquids dispersed in aqueous medium over long periods of time.

Darvans are soluble in water, with a neutral pH, and stable toward mild acids and alkalis. Characteristically, Darvans break up agglomerates or flocs to their ultimate particle size to produce better dispersions.

Recent tests indicate that very small amounts of Darvan actually increase the effectiveness of toxicant in wettable concentrates. Field tests showed greater crop yields when Darvan was added to the active agent and carrier than when the same carrier and agent were used without Darvan. The addition of Darvan with a wetting agent also increased the yield.

Continental Clay

Continental Clay is recommended as a highly compatible and non-alkaline carrier for your agricultural high bulk dust. Continental is further recommended for wettable concentrates.

For both High Bulk Dusts and Wettable Concentrates, Continental Clay is an economical, top quality carrier of unusually fine particle size (0.8 micron by air permeation and less than 0.75% retention on a 200 mesh screen). Continental is a non-abrasive, extremely flowable carrier for high bulk dust. In wettable concentrates, it is outstanding in qualities of dispersibility and wettability. Continental Clay assures uniformity for all your dry dusts and wettable concentrates. Continental Clay is always available in adequate supply.

R. T. VANDERBILT CO.

SPECIALTIES V *DEPARTMENT*

Write today for Bulletin No. D23 on Agricultural Dusts and Sprays.

230 PARK AVENUE, NEW YORK 17, N. Y.

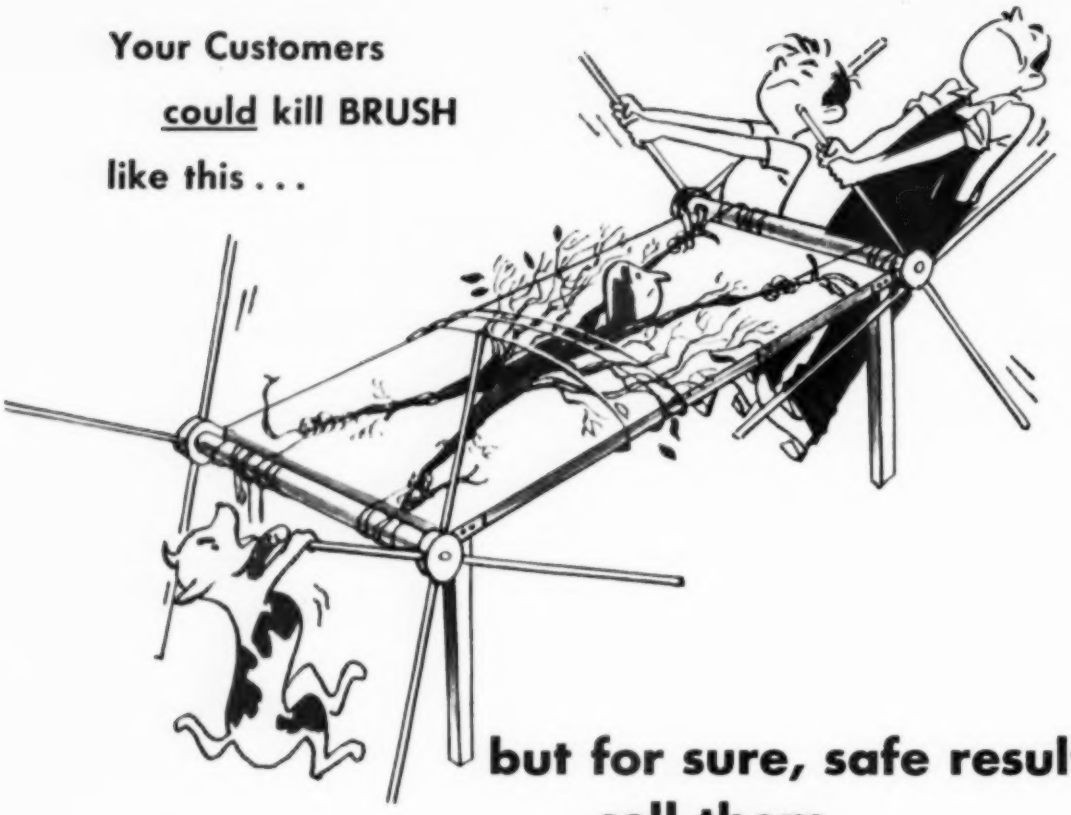
- ☐ Please send bulletin D23.
- ☐ Please send sample of PYRAX.
- ☐ Please send sample of DARVAN.
- ☐ Please send sample of CONTINENTAL CLAY.

NAME _____

POSITION _____

(Please attach to, or write on, your company letterhead)

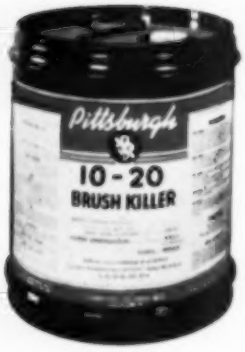
Your Customers
could kill BRUSH
like this . . .



but for sure, safe results sell them

Pittsburgh

10-20 BRUSH KILLER



Want to increase your weed killer sales and profits? Then cash in on the demand for Pittsburgh 10-20 Brush Killer—one of the safest and most popular general brush killers on the market today. It's especially tailored for farm and home use and contains the new Pittsburgh low volatile Isooctyl ester to minimize danger to nearby crops. What's more, Pittsburgh 10-20 Brush Killer is quality-controlled through every production step from raw materials to packaged chemical. For hard-to-kill woody plants, you'll also want to have a good supply of Pittsburgh Brush Killer 22 on hand. Better place your order for Pittsburgh today . . . and be sure!

PITTSBURGH AGRICULTURAL CHEMICAL COMPANY

EMPIRE STATE BUILDING, NEW YORK 1, NEW YORK

W&D 4615

Standard for Quality

ORGANIC INSECTICIDES: Benzene Hexachloride, Toxaphene, DDT, Aldrin, Dieldrin, Chlordane.
ORGANIC PHOSPHATE INSECTICIDES: Parathion Wettable Powders, Parathion Liquid Concentrate, Metacide, Systox.
WEED KILLERS: 2,4-D Acid, 2,4-D Amine Concentrates, 2,4-D Ester Formulated Concentrates, 2,4-D Sodium Salt Monohydrate, D4 (Low Volatile 2,4-D Ester), C4 Pre-Emergence Weed Killer, 2,4,5-T Formulations.
FUNGICIDES, SEED DISINFECTANTS, COTTON SPRAYS AND DUSTS, AND OTHER SPECIAL AGRICULTURAL CHEMICALS.

A DIVISION OF
PITTSBURGH COKE & CHEMICAL CO.
Grant Building - Pittsburgh 19, Pa.

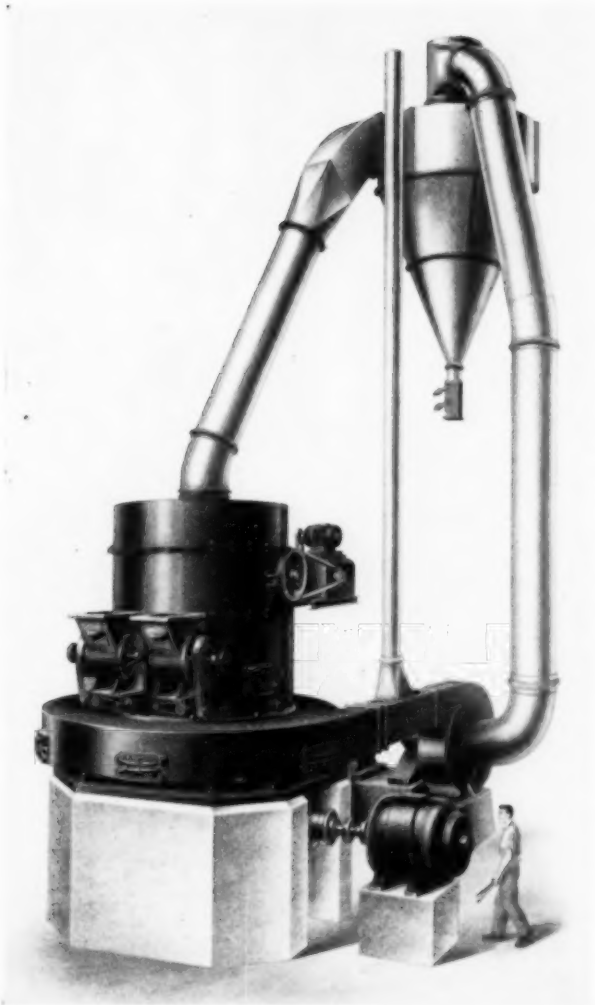
COAL CHEMICALS • AGRICULTURAL CHEMICALS • FINE CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

SINCE 1887

RAYMOND ROLLER MILLS

Preferred for over half a century

FOR PHOSPHATE ROCK GRINDING



RAYMOND Super Roller Mill
for extra large production

More than two hundred Raymond installations in industry alone, handling all types of deposits, show how widely Raymond Roller Mills are accepted as standard units for producing phosphate rock for acidulation and direct application.

These mills have an outstanding record for economy of production, low operating and maintenance cost, ease of fineness adjustment, and dustless operation. These units make a compact, flexible installation, requiring a minimum of floor space, and they may be arranged to fit practically any plant layout.

Raymond Roller Mills are equally efficient for handling your insecticide powder production, involving regular field strength materials, high concentrates or sulphur.

If you have a grinding problem, Raymond equipment, experience and service will insure satisfactory results.

For complete details of the Roller Mill, write for Raymond Catalog #69

COMBUSTION ENGINEERING – SUPERHEATER, INC.

1314 NORTH BRANCH ST.
CHICAGO 22, ILLINOIS

Raymond
PULVERIZER DIVISION

SALES OFFICES IN
PRINCIPAL CITIES

FOR DEPENDABLE HEAVY-DUTY SHIPPING SACKS...

there is no substitute for kraft!

Kraft, manufactured from wood fibers, is the strongest paper known to industry. It was introduced in this country in 1909, just about the time when the first generation of Gilmans started manufacturing bags.

As pioneers, we have spanned the years with practical knowledge, technical skills, packaging experience . . . and our modern, completely integrated facilities are a notable example of kraft paper production and conversion.

Now in our 3rd generation of specialization, we are expert in pulp and paper making, in bag manufacturing, in bag printing, in bag designing.

Dependable as a Source . . .
Dependable as a Service

KRAFT BAG CORPORATION

GILMAN PAPER COMPANY SUBSIDIARY
630 Fifth Avenue, New York 20, N. Y.
Daily News Bldg., Chicago 6, Ill.
Plants at Gilman, Vt. & St. Marys, Ga.

MADE-TO-ORDER MULTIWALL SHIPPING SACKS
3 TO 6 PLY—PRINTED OR PLAIN

- Sewn Valve
- Sewn Open Mouth
- Pasted Valve
- Pasted Open Mouth
- Flat Sewn Valve
- Flat Sewn Open Mouth

Gilman PAPER CO.
• St. Marys Kraft Corp.
• Gilman Paper Co.
• The Coloma Corp.
• Kraft Bag Corp.

If your product fits into a bag—we'll make the bag to fit your product

Prompt Delivery of *Nacconol*®

THE LOW COST "CURE" ACCELERATOR

FROM NEARBY WAREHOUSE STOCKS

As little as one pound of *Nacconol*® per ton of Fertilizer

- Assists in keeping finished fertilizer free-flowing in the bag and in the curing bin
- Avoids the regrinding of lumped bagged goods
- Substantially reduces curing time
- Breaks the bottleneck of curing-bin capacity

What NACCONOL is

Nacconol is America's oldest low-priced, mass-produced synthetic surface-active agent. Millions upon millions of pounds of Nacconol have been used over the past twenty years.

How NACCONOL works

As little as one pound of Nacconol per ton of finished goods, accelerates the reaction between the super phosphate and the ammoniating solution . . . causes the batch to cure in much shorter time. And because the cure is more complete, "mixed goods" are free-flowing — in the bin — in the bag — in the fertilizer spreader. You cut costs in the plant, avoid regrinding of lumpy bagged material. Your farmer friends get a better product from every angle.

How NACCONOL is used

Dry Application:

Use Nacconol NR Flake or Dense Beads—the free flowing, non dusting types that disperse beautifully and uniformly. Add the required amount at the weighing hoppers or pre-mix with potash or other dry materials being used in the mixture. It is important that the Nacconol be distributed throughout the mix as thoroughly as possible.

Wet Application:

Use Nacconol NR Flakes or Nacconol Z Flakes—both readily dissolved in tap water. Where conditions permit, the required amount of either type of Nacconol may be dissolved and added directly to the mixer.

TIME TESTED • AVAILABLE NOW • BEST ALL-AROUND MONEY VALUE

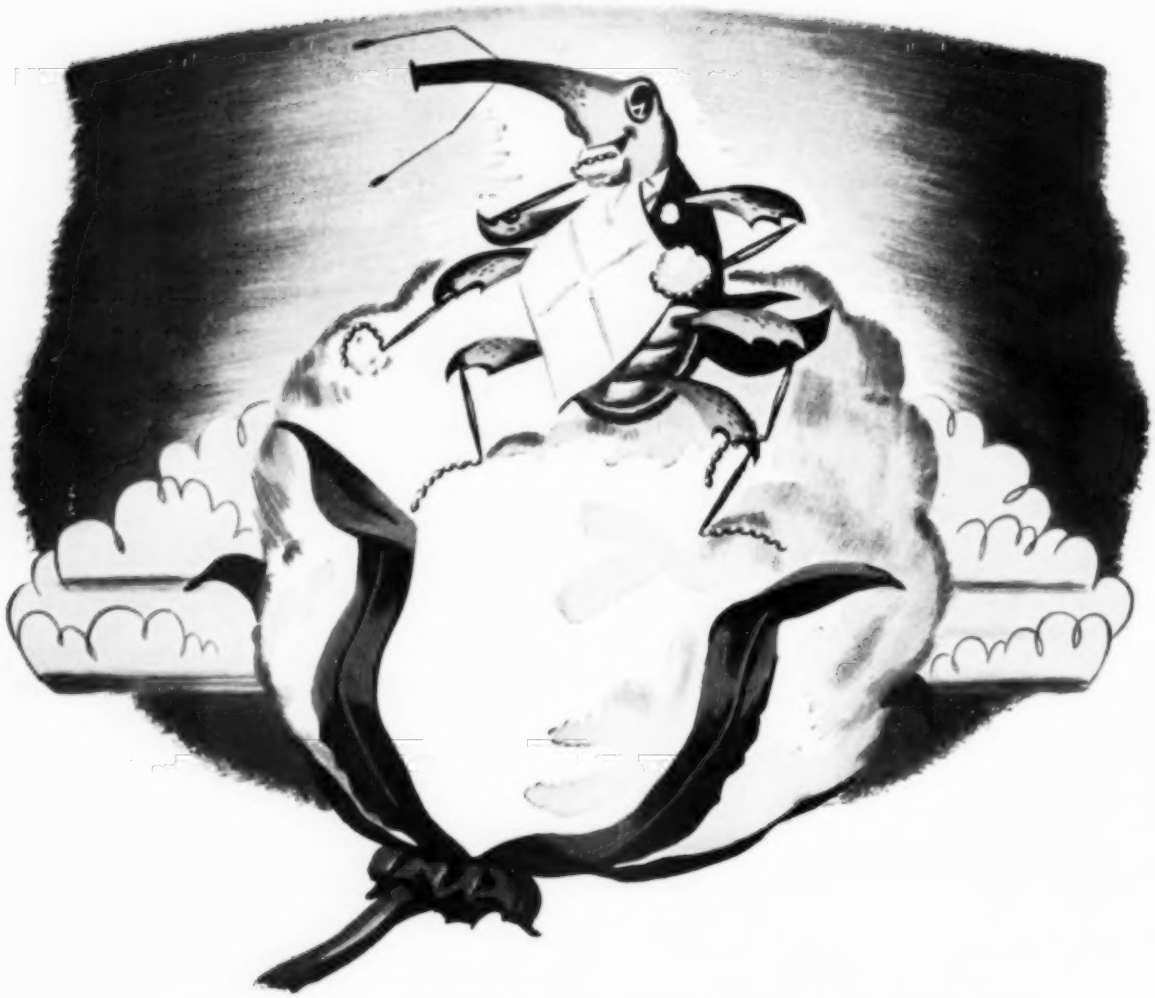
Write, wire or phone our nearest office for price and delivery.

NATIONAL ANILINE DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET, NEW YORK 6, N.Y. • BOwling Green 9-2240

Boston 14, Mass., 150 Causeway St.	CApitol 7-0490	Richmond 19, Va., 8 North Fifth St.	Richmond 2-1930
Providence 3, R.I., 15 Westminster St.	DExter 1-3088	Columbus, Ga., Columbus Interstate Bldg.	Columbus 3-1029
Philadelphia 6, Pa., 200-204 S. Front St.	LOmbard 3-6382	Greensboro, N.C., Jefferson Standard Bldg.	GReensboro 2-2518
San Francisco 5, Cal., 517 Howard St.	SUtter 1-7507	Chattanooga 2, Tenn., James Building	CHattanooga 6-6347
Portland 9, Ore., 730 West Burnside St.	Beacon 1853	Atlanta 2, Ga., 254 E. Paces Ferry Rd.	EXchange 3594
Chicago 54, Ill., The Merchandise Mart	SUperior 7-3387	New Orleans 12, La., 714 Carondelet Bldg.	Raymond 7228
Charlotte 1, N.C., 201-203 West First St.	CHarlotte 3-9221	Toronto 2, Canada, 137-143 Wellington St. W.	Empire 4-6495



BOLL WEEVIL . . . BEWARE!

The ruinous rampages of this billion dollar bug are coming to a screeching halt, thanks to pesticides formulated with Tennessee's Benzene Hexachloride. Dust and spray formulations of BHC* from TENNESSEE deal death to the Boll Weevil surely and quickly.*

With Benzene Hexachloride plants at Wichita, Kansas, and Chattanooga, Tennessee, quick deliveries of your BHC* requirements are assured.*

Tennessee Products is your dependable source of supply for Lindane—pure gamma isomer, technical BHC, DDT, and the excellent weed and brush killers 2,4-D and 2,4,5-T.

TENNESSEE is a basic source, from raw material to finished product. This is your assurance of a steady supply of effective and efficient insecticides and herbicides.

TENNESSEE
PRODUCTS & CHEMICAL
Corporation
NASHVILLE, TENNESSEE

DEPENDABLE, HIGH SPEED BAG CLOSING EQUIPMENT

Engineered

to meet modern PRODUCTION REQUIREMENTS

NO two jobs are exactly alike—that's why Union Special builds a wide variety of bag closing equipment. In the Union Special line you will find machines for closing all sizes and kinds of bags from small textile or paper bags of one pound, or less, up to the largest multiwall paper bags in use today. Whether your production schedule calls for closing just a few bags or for high continuous output, Union Special can supply the equipment to do the work efficiently, economically, dependably!

Coupled with a complete line of equipment is Union Special's vast background of experience and technical know-how that insures customers of getting THE RIGHT MACHINE FOR THE JOB!

Union Special representatives located in all leading industrial centers are qualified by experience and training to give you expert recommendations. Take advantage of the service they offer.

Ask for recommendations. UNION SPECIAL MACHINE CO., 447 North Franklin St., Chicago 10, Illinois.

Send for Bulletin 200

CLASS 21800 (left) for fast, economical closing of paper bags. Illustrated is Style 21800 H with 5 ft. conveyor and M5600 H sewing head for making tape bound closure. Tape is cut off automatically at each end of closure. Sewing head and conveyor adjustable vertically.

CLASS 20500 (above) machines are heavy duty, high production units for closing medium and heavy weight bags. Available with power-driven horizontal conveyor, inclined conveyor, or both; or with conveyor transmission unit only, for plant production line.

STYLE 20100 H (left), is a heavy duty, high production column type machine designed for use with plant conveyor systems. Sewing head is pedal controlled.

DUPLEX MACHINES (right) are designed for closing double bags. The first sewing head closes the inner bag; the second closes either the outer bag alone, or both bags together for extra safety. Also recommended for single closures where continuous operation is a must—operator can instantly switch to other head.

Union Special®

BAG CLOSING MACHINES

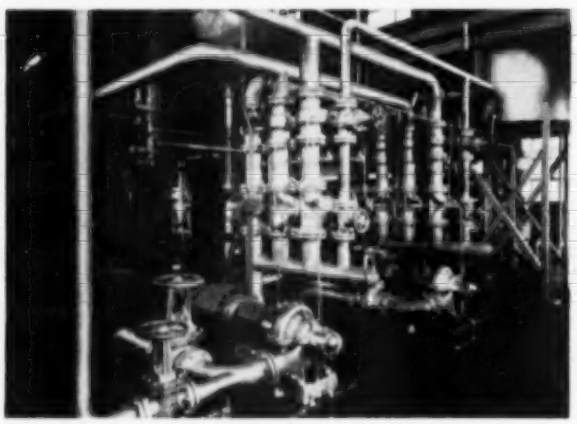
MORE PRODUCTION WITH LESS EFFORT!

G. O. McMillin is manager of the Fertilizer Division, Northwest Cooperative Mills, Inc. He says Spencer service meets a definite need in the fertilizer industry.

Fertilizer from this modern plant at Winona, Minnesota, helps boost crop yields on farms throughout the Upper Midwest. Constructed in 1947 this Northwest Cooperative Mills plant, with its sister plant at Green Bay, has a capacity of 80,000 tons annually. Both plants were expanded in 1951.

Northwest Cooperative Mills, Inc.

...Another Spensol User



From plants like this, Spensol (Spencer Nitrogen Solutions) is shipped direct to your plant. Dependable service and quality have made Spensol the choice of many of America's famous mixers.

These technical service experts specialize in finding the answer to your production problems—even if you are not a Spencer customer. There is no charge or obligation for this Spencer Service.

SPENCER

SPENCER CHEMICAL COMPANY, Dwight Bldg., Kansas City 5, Mo.
Southeastern District Sales Office: 412 Candler Bldg., Atlanta, Ga.
Works: Pittsburg, Kansas; Henderson, Ky.; Chicago, Ill.; Vicksburg, Miss. (under construction)

America's Growing Name in Chemicals

Left – untreated onion; Right – treated with MH-40

Naugatuck nips storage growth in bud!

The United States Rubber Company's Naugatuck Chemical Division has good reason to believe it has dealt a death blow to destructive storage growth. The reason is a new Naugatuck chemical – a water soluble salt containing 40% maleic hydrazide and called MH-40.*

Every grower knows the advantage of storing away part of a crop like onions until the market is more favorable. And every grower also knows the risk involved – namely, the sprouting, shriveling and wrinkling which can make that crop unsalable.

As far back as 1947, Naugatuck's research scientists came up with the first version of MH-40. Since then, working in cooperation with more than 250 experiment stations and other agriculturists, they have discovered hundreds of potential uses for this unique new chemical. One of these uses was for the inhibition of storage growth.

Today MH-40 is commercially available as a grass inhibitor and wild-onion killer. And it won't be long before it will be made available as a storage growth inhibitor, too! *U. S. Pat. No. 2,614,916

MH-40 is one more example of Naugatuck know-how at work, always striving to introduce new and better products to the agricultural field.

UNITED STATES RUBBER COMPANY Naugatuck Chemical Division, Naugatuck, Conn.

manufacturers of seed protectants – Spergon, Spergon-DDT, Spergon-SL, Spergon-DDT-SL, Phygon Seed Protectant, Phygon Naugets, Phygon XL-DDT, Thiram Naugets, Thiram 50 Dust – fungicides – Spergon Wettable, Phygon-XL – insecticides – Synklor-48-E, Synklor-50-W – fungicide-insecticides – Spergon Gladiolus Dust, Phygon Rose Dust – miticides – Aramite – growth retardants and herbicides – MH-30, MH-40 – pre-emergence weed killers – Alanap-I.

AERO* CYANATE,

WEEDKILLER

helps onion growers raise larger, more profitable crops

AERO Cyanate—a selective, contact herbicide—is easily applied as a spray to kill young weeds in onions and other bulb crops. It eliminates costly hand-weeding . . . saves time . . . lowers production costs. The onion crop grows to full size, unhampered by choking weeds.

Cyanate is readily water-soluble, and will not stain work clothing. Equipment cleans easily with plain water. After application, Cyanate breaks down to form compounds containing ammonia and potash.

More and more growers are now weeding chemically with AERO Cyanate. If you are not now making AERO Cyanate sales, here is a profitable addition to your line of products for agriculture. *Write for descriptive literature.*

AMERICAN Cyanamid COMPANY

Agricultural Chemicals Division

30 Rockefeller Plaza, New York 20, N. Y.

Producers of

AERO® Cyanamid
Fertilizers—Defoliants—Herbicides
AEROPRILLS,® Fertilizer Grade Ammonium Nitrate
PHOSPHATES for Acidulation and Direct Applications
MALATHON Insecticides
THIOPHOS® Parathion Technical
CYANOGAS® Calcium Cyanide Fumigants
HCN Fumigants
POTASSIUM CYANATE Weedkiller for Turf
AEROTIL® Soil Conditioners

*Trade-mark

Editorial COMMENTS

DECLARING that "having a supply of poison ready for use when it is needed is good crop insurance", the National Cotton Council is urging its members to lay in supplies as early as possible. "A hungry cotton pest has little respect for a grower's schedule", the council reminds and adds that "delay in obtaining poisons during periods of heavy infestations by cutworms, armyworms, thrips, boll weevils or other pests could result in serious damage."

It is explained further that proper timing and application intervals are all-important to success of an insect control program . . . even more important than the type of insecticides used. Thus, it is only by having the material on hand that a grower can be able to apply the toxicants when and as often as needed.

We feel certain that the agricultural pesticide trade will more than second the motion made by the Cotton Council. It is encouraging to see agencies outside of the trade itself, advising users to buy early.

THE new Miller Bill, H.R. 4277, appears to be one of the most reasonable legal proposals covering pesticides that has come up for a long time at the Federal level. Not to be confused with the "Miller Bill" of the 82nd Congress, the new one takes a more realistic view of the situation. It sets time limits on action by the Federal Security Administrator, limiting to 90 days the period in which he would have to act on a petition to establish a residue tolerance for a given product.

The industry has had a bad time previously in this regard as evidenced by the fact that it is now two years since lengthy hearings by the Food and Drug Administration were held, and up to the time of this writing, not a single tolerance has been forthcoming. The confusion and hampering of production because of this has been tremendous as every pesticide manufacturer well knows.

Other favorable features of the new bill include the setting up of a disinterested committee of experts chosen in equal number by the Administrator; the person filing the petition asking for such a review; and by the chairman of the Food Protection Committee of the National Research Council.

The bill also provides recourse to the courts on grounds other than merely attempting to prove that the Administrator acted arbitrarily or capriciously in making his decision, a weakness in previous bills.

One of the most important points, we think, is the separation of pesticides, legally, from other so-called "additives" and from regulations covering cosmetics. That consideration of the latter has no connection whatever with control of insects or agricultural corps, is so obvious that many in the trade have wondered for years how cosmetics managed to get into the act in the first place.

Food additives, also must be set apart as separate entities. They are used or not used in foods as a matter of choice; but pesticides are employed only through necessity. In many cases, without pesticides there are no crops!

(*Editorial Continued on Page* 109)

Optimism Shows Through Industry's Gloom at New Orleans as

NAC Association Meets

THAT the use of pesticides may make the difference between profit and loss during periods of falling farm prices was emphasized by Arthur W. Mohr, president of the National Agricultural Chemicals Association, in his keynote address at the group's annual spring meeting at the Jung Hotel, New Orleans, La., March 11-13. The meeting, attended by more than 300 persons, included speakers representing the manufacturing industry, federal and state agencies, the U.S. Department of Agriculture and the Federal Government as well as NAC staff members.

In continuing with his appraisal of the current situation in the pesticide industry, President Mohr declared that the trade faces an unprofitable year for 1953. "At present, manufacturing capacity for most agricultural chemicals is much greater than the demand, so it appears that prices may remain low and that as an industry, the profits will be meager if there are any at all."

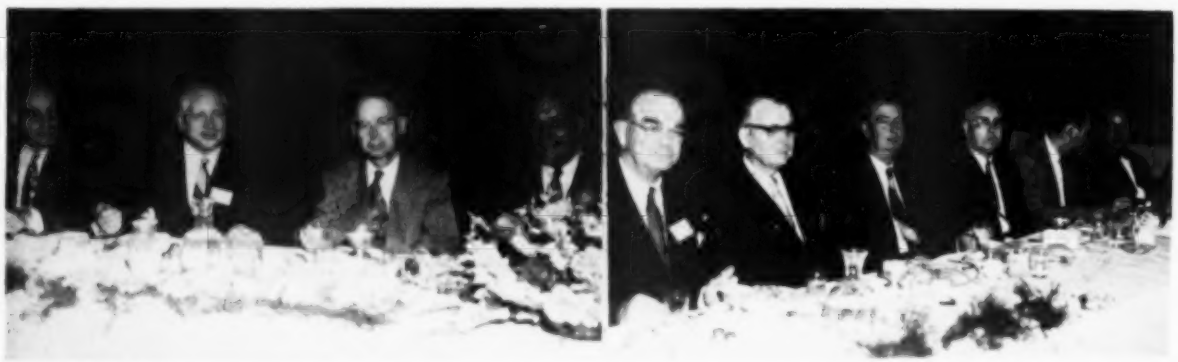
Describing his point of view as "realistic", he pointed out that the over-supply situation of pesticides has resulted in price reductions, some of which he called "drastic". He reported that reductions have amounted to about 50 per cent on such chemicals as DDT and benzene hexachloride. "Prices of finished formulations made from all chemicals," he continued, "have been reduced more in proportion than the reduction of base chemical cost."

The NAC head expressed hope that the industry would make an effort to reach the grower with more information about the economics of pesticide use. "Doesn't it make sense that in time of low farm prices, if a farmer fully protects his crops he has a much better chance for profit?" he asked. Several examples of increase in net gain through the control of agricultural pests were cited by Mr. Mohr. He explained that by the control of corn rootworm, yields of peanuts could be nearly doubled, with gains of up to $200 per acre in some instances and an average increase in profit of around $100 per acre.

"Weeding cotton with chemicals can be done for a cost as little as $5 per acre, whereas hand

PHOTOS BELOW:

Left to right: (at banquet head table) W. W. Allen, Dow Chemical Co., Midland, Mich.; Ernest Hart, Food Machinery & Chemical Corp., New York; Eugene Butler, *Progressive Farmer*, Dallas, Texas; A. W. Mohr, California Spray-Chemical Corp., Richmond, Calif, NAC president; T. L. Wilkerson, American Cyanamid Co., New York; A. Petrus, Cotton States Chemical Co., West Monroe, La.; Russell Stoddard, U. S. I. Chemicals, New York; Ed. Phillips, GLF, New York; Dr. Charles E. Palm, Cornell University, Ithaca, N. Y., president, Entomological Society of America; and Lea S. Hitchner, NAC Assn., Washington, D. C.



PHOTOS THIS PAGE

Top row (L to R): Jackson Vernon, Niagara Chemical Div., Middleport, N. Y.; John Rodda, U. S. I. Chemicals, New York; and Ed Phillips, Silas Besthoff, Fassy & Besthoff, New York; and B. M. Van Cleve, Sherwin-Williams Co., New York.

Second row: Dr. Charles E. Palm, Cornell Univ.; and Dr. H. L. Haller, B. E. P. Q., Washington, D. C. Dalton Shields, R T. Vanderbüt Co., Atlanta, Ga.; Jack W. Moore, Floridin Co., Warren, Pa.; and D. L. Kent, B. F. Goodrich Chemical Co., Cleveland, Ohio.

Third row: Charles Hovey, Eastern States Co-op., Springfield, Mass.; David Prendergast, Dow Chemical Co., San Francisco; E. S. Heckathorn, United Chemical Co., Richmond, Calif.; and T. L. Bendall, Dow Chemical Co., New York. E. D. Witman, Columbia-Southern Chemical Co., Pittsburgh, Pa.; Dr. Carl Fischer, Carbide & Carbon Chemicals Div., New York; and Leo R. Gardner, Calspray, Richmond, Calif.

Fourth row: Mrs. Douglas G. Bennett and Mr. Bennett, Phelps-Dodge Refining Corp., New York. John Van Geluwe, GLF, Ithaca, N. Y.; Dr. Fischer; and J. A. Field, Carbide & Carbon Chemicals Div., New York.

Fifth row: H. C. Koehler, Monsanto Chemical Co., St. Louis, Mo.; G. C. Romig and M. B. Turner, both of American Chemical Paint Co., Ambler, Pa. A. W. Mohr and H. L. Haller.

Bottom row: R. H. F. Dade, Niagara Chemical Div., Jacksonville, Fla.; Russell Stoddard, Sol Epstein, Emulsol Corp., Chicago, Ill.; Dr. H. L. Sanders, Ninol Corp., Chicago; and Theodore Reideburg, Reideburg Associates, New York.

weeding may amount to 3 or 4 times this much," he asserted.

He emphasized that the boll weevil still causes the largest amount of damage to the cotton crop, even though insecticides have reduced losses. He pointed out, however, that "a preventive program of control is needed to further reduce losses which under average conditions still amount to about 25 per cent of the crop."

He told the manufacturers of pest control chemicals that he had the "unpleasant duty" of forecasting an "unprofitable year" for the industry. "At present, manufacturing capacity for most agricultural chemicals is much greater than the demand, so it appears that prices may remain low and that as an industry the profits may be meager if there are any at all," he stated. He explained that this is neither a "happy nor a healthy" situation but a "realistic" one.

E. C. McCLINTIC JOHN D. CONNER JOSEPH NOONE L. S. HITCHNER H. G. JOHNSTON R. J. KOWAL

Lea S. Hitchner, executive secretary and treasurer of the Association, presented his report of the Association's activities since the September meeting. Mr. Hitchner also reported the status of a number of bills expected to be introduced in the Congress this session, affecting the sale and distribution of pesticides.

He expressed hope that irresponsible publicity will not flood the public press again in this connection, giving extremists no opportunity to present their views to receive wide publicity and confuse the public.

Some kind of legislation is practically inevitable, Mr. Hitchner predicted, but indicated hope in the industry that such new laws may be reasonable and not too restrictive in nature. Elimination of irresponsible publicity and heavy expense to the industry in conducting unnecessary further studies is one of the goals of the industry, Mr. Hitchner indicated.

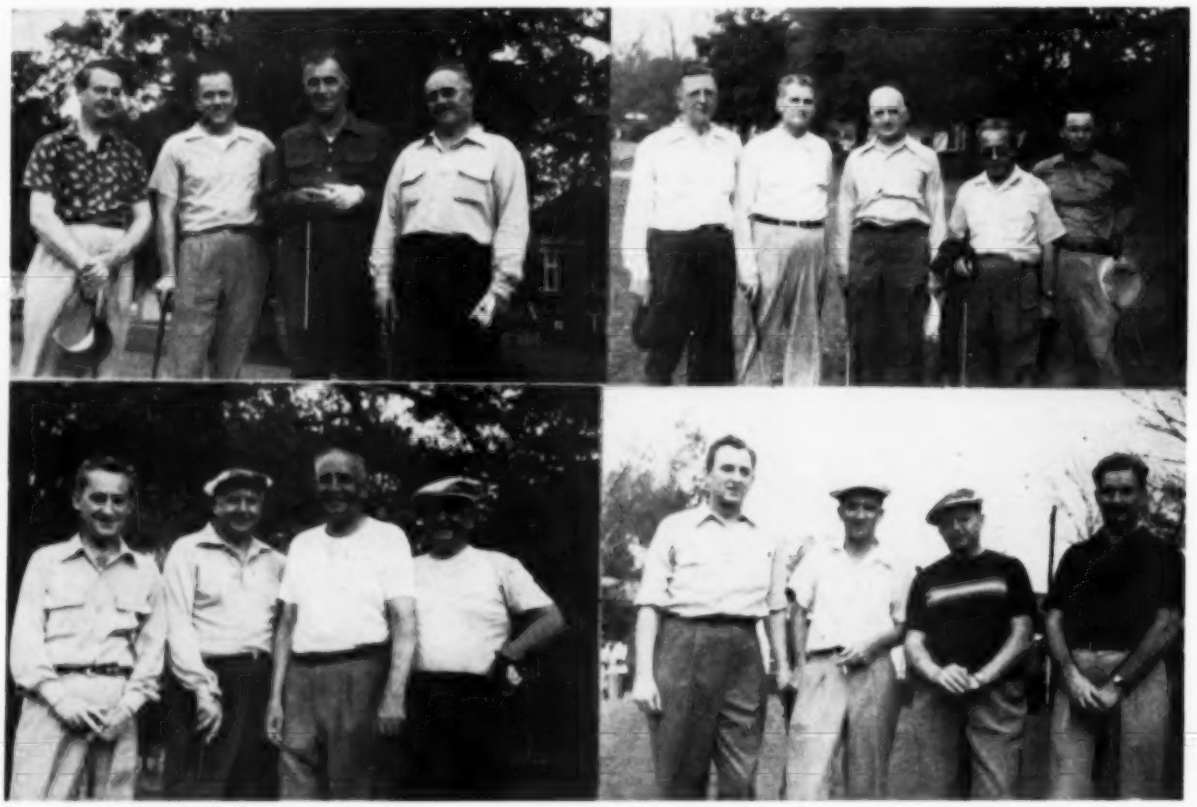
Golfing with NAC: top row, L to R: M. B. Turner, Albert Clem, Pennsylvania Salt Mfg. Co., Philadelphia.; Stewart Bear, Niagara Chemical Div., Middleport, N. Y.; and E. H. Phillips, B. M. Van Cleve; Jackson Vernon; Ira Vandewater, R. W. Greeff & Co.; P. Rothberg, Montrose Chemical Corp. of Calif., Newark, N. J.; and John A. Nicholson, *Agricultural Chemicals*, New York.

Second row:

G. Oliver, California Spray-Chemical Corporation; Ernest Hart; A. W. Mohr; and Horace W. Lee, Niagara Chemical Div., Tallulah, La. Jack Coey, Hooker Electrochemical Co., Niagara Falls, N. Y.; T. Walter Reed, California Spray-Chemical Corp., Richmond, Calif.; William Newton, Columbia Southern Chemical Co., Pittsburgh; and John D. Conner, Washington, D. C.

Hoyt Names Problems

WIDESPREAD resistance of insects to various pesticides has become the "modern entomological headache," according to a paper by Avery S. Hoyt, chief, Bureau of Entomology and Plant Quarantine,



C. E. PALM | A. W. MOHR | H. R. JOHNSTON | A. F. CAMP | W. C. SHAW | SEN. ELLENDER

U.S. Department of Agriculture, Washington, *D.C.* The paper was presented by Dr. H. L. Haller, assistant chief of Bureau, in the absence of Mr. Hoyt. Reports of harder-to-kill insects are occurring with increasing frequency, the paper declared. The problem is not limited to resistant houseflies, mosquitoes, roaches nor body lice, but is of a much more widespread nature, the paper continued. The matter is made serious by the codling moth problem, the Colorado potato beetle problem and others that could affect our food and feed supplies, it was pointed out.

"We don't know just how long present insecticidal controls, most of which are still remarkably effective, will continue to help growers give this nation the bumper crops of food, feed and fiber so necessary to the present high standard of living." It was pointed out further, that neither scientists nor chemical manufacturers have the answer to the problem as yet.

The Bureau chief's paper emphasized that entomological problems have become more complex than ever before and have reached the point where they can become acute almost over night. "Pressure for their solution is intense—and usually quite vocal," it said. In spite of this, the paper indicated that the Bureau of Entomology and Plant Quarantine has been "undergoing a shrinking process" for some years. "It is smaller today from the standpoint of manpower, than it was in 1932."

One of the most threatening of agricultural pests is the pink boll worm which was described as being at times "the most serious threat since the appearance of the weevil."

Cotton pests present one of the most difficult situations faced by

NAC Meeting Sidelights

IN spite of rather somber predictions as to what lies ahead of us in the coming insecticide season, members of the NACA exhibited a rather gay mood as they met in New Orleans for the group's annual spring meeting. Maybe it was the influence of the Ramos fizzes, maybe it was "Cupcake" or maybe it was just that an insecticide salesman is a pretty hard bird to discourage when spring is in the air and he starts to think of a warm, rainy June, with the bugs starting to bite.

* * * *

New Orleans proved to be another happy selection as a convention city. The Hotel Jung handled the group well. The rooms were attractive and well appointed, at least in the new wing. New Orleans is of course noted all over the world for its food. Plenty of opportunity for diversion was afforded, what with a golf course, race track and Lake Pontchartrain handy. And the formal program, as usual, was not the type that keeps the group inside meeting room doors from dawn til dusk. This is one group that realizes that people attend meetings in many cases largely for the opportunity of seeing one another, and not necessarily to listen to speeches.

* * * *

This agent, having never visited New Orleans before, sneaked in to town early to check up on all the local color in advance. And as so many prior visitors have apparently observed, found much of it concentrated in the French Quarter. The Dixieland bands, the gumbo, the pecan pralines, the iron grill work, Rampart and Bourbon streets, all add up to make an unforgettable impression that is duplicated in no other city in the world. And while making this curtain raising survey, boys, we discovered that there ain't no "Streetcar named Desire." It's now a bus.

* * * *

Bourbon Street, aptly named at a $1.25 per bourbon, was the focal point for much of the evening activity. Surprisingly enough, most of the visitors were there to hear the Dixieland Jazz Bands. Prominent among the Jazz aficianados were Art Bixby and Ted Riedeburg. Ted, by the way, is an old Dixieland man himself. His instrument he admitted is the saxaphone.

* * * *

New Orleans featured no dog track such as we had two years ago in Miami, but the boys who love to tangle with the mutuel machines found a good substitute. There were horses instead, out at old Fairgrounds' — and how the favorites bounced down!

* * * *

One of the minor awards at the track was a horse collar of roses which V. P. Mayfield showed up wearing at the banquet. Jack Miller and your correspondent emerged wearing just horse-collars.

* * * *

Len Gopp, perennial captain of the Poker Team, poured tea in his 16th floor suite each evening as the team members went through their customary rigorous training course. Hardened by the knowledge of what damage a small full house can do to a pretty "all pink" hand, they emerge from their training siege better able to cope with the rigors of the new season's DDT market. Ed Dobbin, Morey Turner and Sam Marshall won their letters this year.

* * * *

Spring training is nothing new to Charlie Gerlach. Seems Charlie is an old pro at the game of baseball. He spent several seasons with various teams just below major league status back a few years ago, before invading the insecticide business.

* * * *

Two busted elevators got the annual dinner off to a slow start. However may we piously suggest to next year's committee that the way to get the group down to dinner on time — and in huge numbers — is to provide the two essentials of the good party, free cocktails and sweet music in the background.

(*Turn to Page* 135)

In the Photos

Top row (L. to R.): E. H. Phillips; H. W. Lee; George F. Leonard, Tobacco By-Products & Chemical Corp., Richmond, Va.; P. J. McManus, GLF, Ithaca, N. Y.; and Jack Moore.

Second row: Richard O. Hartley, Remsen Chemicals, Inc., Oceanside, L. I., New York; Charles Ralls, Inland Steel Container Co., New Orleans; George Fiero, Esso Corp., New York; P. J. Reno, Hercules Powder Co., Dallas, Texas; and Danny Donahue, Inland Container, New Orleans.

Third row: Dr. Palm; Dr. H. G. Johnston; and R. J. Kowal.

Fourth row: Jackson Vernon; Mrs. R. H. F. Dade; George Oliver, Calspray; and A. W. Mohr.

Bottom row: Joseph L. Flores, Export Chemical Corp., Denver, Colo.; Paul Torpin, McLaughlin Gormley King Co., Minneapolis, Minn.; Horace W. Lee; Tom Bogaard, MGK, Kansas City, Mo.; and Melvin Goldberg, Pesticide Advisory Service, New York.

the Bureau, the paper declared. "The boll weevil must be controlled nearly every year," it said. This means any cotton insect control program must take several insecticides into consideration.

"Suppose an effective, inexpensive insecticidal program is found that will serve the purpose of the cotton farmer. The question comes to mind immediately—will the insects develop resistance to the chemicals, and how soon?

"To answer these questions, entomologists will seek every means available to control the pink bollworm. They will try to develop a control program using insecticides that will include all the major insects. But at the same time, they will seek cultural control, biological control and any other methods of control that can be used for the protection of the cotton industry. . . ."

URGING industry to give proper recognition to the importance of a company traffic director and to regard him as holding an important place in company management, E. C.

(*Turn to Page 119*)

by

E. O. Burroughs, Jr.

F. S. Royster Guano Co.
Norfolk, Virginia

In presenting this talk, author illustrates remarks with series of drawings on stand. Pictures show various scenes in fertilizer plant, as shown in photo at right.

Importance of Housekeeping In FERTILIZER PLANTS

MANAGEMENT in all industry is searching continually for new equipment and new procedures which will pay their way through increased production. The fertilizer industry, only a few years ago, employed cheap labor which, with the aid of the pick, shovel and "Georgia buggy," was able to produce fairly satisfactorily in keeping with the demands of that time.

With labor now one of the most expensive items in manufacturing, management now looks for and must get results commensurate with this rise in the cost of manpower. This calls for foremen who not only know their jobs, but who can train laborers to work intelligently and safely.

What part does "housekeeping" play in this over all need for more efficiency, lowered costs and greater production? A prominent industrialist in another field, expressed it in this way in a recent article:

> "It is my opinion that general good housekeeping and appearances are an important factor in mental guidance of the worker. The appearance of the grounds and the internal factory area establish the frame of mind in which the workers approach their daily tasks. We believe that 'a good housekeeper is a good worker' and we can prove it."

The author has reason to believe this statement is 100% true. Plant housekeeping is vitally related to three aspects of fertilizer manufacture:

1. Actual Production
2. Maintenance and repairs
3. Protection of Capital

The purpose of this paper is not to engage in a technical nor theoretical discussion, but rather, to point out some down-to-earth matters, things familiar to any observant individual around a fertilizer plant. These conditions do not exist in all plants, but they are still seen too frequently although some progress has been made in correcting some of the hazards mentioned in the following pages.

Above the heads of men working on the ground floor, an attendant at the screen level of a mill unit is responsible for removing foreign matter screened from the fertilizer itself. If he does his job correctly, the screen level will be kept clear of accumulated dust and debris removed from the screen, removing it at regular intervals to the proper place. This can be done without extra effort, when the workman climbs down for lunch, or at the end of his working day. The job *will* be done if the foreman is on the job to see that it is done.

If the foreman fails to look after this, there will soon be a large assortment of miscellaneous materials collected at the screen level. As many as a dozen to thirty bags of debris may be piled up around the edge of the platform against the guard rail, and dust a foot deep may cover most of the platform. A collection of spikes, bolts, nuts and other metallic objects will be lined up on the top guard rail waiting to fall on the heads of men working below.

This condition is both danger-

From paper presented at Southern Fertilizer Safety Conference, Atlanta, Ga., Mar. 4, 1953.

ous and inefficient. The hazard is obvious, with workmen being directly under loose objects; but the inefficiency comes in when the mill has to be closed down to allow the crew to engage in a general cleanup which should have been accomplished while production was under way. Delays of this type are costly.

To see the true condition of a given plant, an inspector should drop in unexpectedly. The writer recalls having called at a factory just a day before the expected visit of the company's general superintendent, and the plant had not yet been "shined up" for the occasion. It was an example of housekeeping at its worst. Trash barrels were surrounded by more material on the outside than could possibly be stuffed within; soft drink bottles had been tossed onto the floor all around the boxes provided as containers; work platforms were covered with fertilizer piled as deeply as two feet; and an ugly heap of splintered wood removed from the screening grill covering the hopper was in full view.

But the next morning when the general superintendent made his expected visit, everything around the plant was as it should be. His report indicated complete satisfaction at the general picture, while that of the inspector, made only hours before, bore no resemblance whatsoever to the later impression.

The fast changeover from a plant of helter-skelter housekeeping practices to one of apparent orderliness was costly, because most of the plant personnel was taken off production for a full afternoon between the inspections, in order to put the factory in the shape it should have been in all the time. Needless to say, with the cost of labor as it is, such practices cut down the general efficiency of any company.

Clean Loading Docks

NOT only is good housekeeping vital inside the plant, but in out-of-doors areas such as the loading docks as well. Attention to picking up tools, cleaning up spilled materials, and leaving the general area uncluttered, is of great importance.

Picture the scene on many loading docks and see if your plant workers are guilty of negligence such as removing car door boards and tossing them on the dock; or of pushing debris from the freight car out the door and onto the ground between tracks simply because this seems to be the easiest way to dispose of it.

With the platform thus obstructed, it becomes necessary to load another car. What happens? The crew must stop its productive work long enough to clear the platform so that the fertilizer may be trucked to the next car. Good housekeeping would have required that these items be put in the proper place at the beginning, rather than stopping the job later to do it.

Aside from their obstructing the work, car door boards cause other troubles, too. Suppose an employee walks over these car boards stacked on the dock and a nail punctures his foot. Even if no infection sets in, there is one man out of the gang while a trip is made to the doctor and probably a one-day lost time accident will have to be entered on the records.

Remember the debris shoved out the car door and down on the tracks by our careless workman mentioned previously? A little later the railroad pulls out the filled cars or brings in empties, and a brakeman stumbles and falls over this thoughtlessly-dumped material. He could well slip under the train and lose a limb, or be seriously hurt otherwise. Of course, the railroad was supposed to clean out the car before it was placed at your plant, it might be argued, but this will not relieve the fertilizer manufacturer of liability for the injury to the railroad employee when such injury results directly from negligence and carelessness on the manufacturer's part. Such an event would add a great deal to the cost of production at that plant!

On the credit side of the picture, it has been proved beyond doubt, that efforts to improve slovenly habits of workmen and to bring housekeeping standards to a higher level, do increase production efficiency. One of the Royster plants in the south has enjoyed an outstanding safety record for the past 15 years. Under the guidance of a safety-minded superintendent for a number of years before his retirement, and under the similar administration of his son since that time, this particular plant has maintained a lost-time accident frequency average of less than 5 during this 15 year period.

Does this attention to clean and orderly working areas have any relation to production? A short time ago, the writer dropped into this plant, unannounced, and found production running smoothly, every tool in its place and working areas free from obstruction. The superintendent, upon being commended for the general tidiness of the plant, announced that a new record for tonnage production had been set that day and that average production was pointing upward month after month! Good housekeeping *does* pay!

Maintenance a Key

IN efficient, modern plants, production depends upon machinery, which means that in the breakdown of a conveyor, an elevator, a crane or any one of many other interdependent machines in the fertilizer plant, promptness in getting the halted machine back to work is all-important. Here's where another phase of good housekeeping comes into play.

Something goes wrong at the head of the elevator of No. 3 mill. Operators stop until repairs can be made, and the plant stands idle while maintenance crew goes about its task. Where is the chain fall needed to do this job? Was it left at the head of elevator No. 1 last week? Or was it No. 4 mill, or was it left in the acid department. Time speeds past while the search is made . . . a search which would not be necessary if tools were put back in place after every use.

Or, maybe a file is missing. Where can it be? Is it covered with dust and ruined near the spot where it was used last? Do the workmen know where the replacement gear is stored . . . or was it dumped over in a corner somewhere with other miscel-

(*Turn to Page* 141)

Review of Foreign

Pesticide Developments

by

Dr. Charles E. Palm*

Head, Department of Entomology
Cornell University, Ithaca, N. Y.
President, Entomological Society
of America

THE control of agricultural pests throughout the world offers a challenge of tremendous import. It affects the supplies of food and fiber as well as the health of people in every nation, and offers a real opportunity to contribute toward the solution of fundamental sociological problems behind world unrest. In the future an even greater demand will be placed on science to supply the materials needed for support of the increasing population of the world. We find ourselves learning to think more and more of the impact that our developments will have abroad as well as at home. Science, fortunately, does not recognize the political boundaries that may be forced upon its products. Regardless of where a discovery is made, all areas capable of using it may benefit. There is definitely an era of great expansion ahead in the world-wide use of chemicals for pest control. The challenge afforded by the growing problems of resistance of insects to insecticides as well as the upset in population balances through the destruction of natural enemies, adds stimulus to the task before us. All aspects of the profession must keep attuned to world-wide developments if leadership is to be maintained and an opportunity made to contribute to the welfare of mankind.

During the winter of 1935-36 the author visited laboratories in Central America where entomological work was in progress. The following year, a period of five months was enjoyed studying in research laboratories and universities in fourteen countries in Europe, many of which are now behind the iron curtain. During 1950, a similar period of travel and study was spent in visiting our own entomological workers and some in Mexico.

Through the past twenty years the author has been privileged to visit many of the Canadian workers and and their laboratories. When the opportunity arose to attend the Third International Congress of Phytopharmacie, held in Paris last September, there was a particular eagerness to go because of the feeling that it would help bring us up to date on some of the developments on the Continent.

It is well known that the past decade has witnessed tremendous strides in pest control through the rapid development of the synthetic organic insecticides. These have revolutionized our concepts and methods for insect control and it should be remembered that many of these developments have come from basic research and its application by European scientists.

Paris Meeting Reviewed

A FEW of the highlights of the Paris Congress should be reviewed, including a definition of the term, "phytopharmacie." As used on the Continent, it deals with the materials, equipment and methods for pest control and plant growth regulation as opposed to the basic sciences

*Paper presented at the Spring meeting of the National Agricultural Chemicals Association, New Orleans, La., March 13, 1953.

of entomology, phytopathology and plant physiology which cover the fundamental phases of the problems.

For example, in France the life history, habits, seasonal development and varietal preference of the Colorado potato beetle would be considered as entomological work; but the investigation of insecticides for its control, a comparison of efficiency of different types of application equipment, etc., would fall into the field of phytopharmacie. It is largely a matter of breaking down the field of applied entomology as we know it, into entomology and phytopharmacie.

On the trip to Europe in the late 1930's, there appeared to be little interest in insecticide research among the European workers visited aside from some entomologists in Germany, England and Holland. To be sure, the arsenicals and other insecticides of the period were in limited use, but generally speaking it was evident that the farmers were not equipped to spray or dust. As a result, most of the French research for Colorado potato beetle control, for example, was directed toward breeding varieties of potatoes resistant to its attack.

The picture has changed during the past fifteen years. Dr. Muller's world renowned discovery of DDT, the discovery by French and English workers of the insecticidal properties of BHC; the development of the phosphate insecticides in Germany during the war and the subsequent research and development of the phosphate systemics by Schrader in Germany, Ripper and his associates in England have been among the most productive fundamental discoveries in the field of insecticidal chemistry in the history of applied entomology.

The expanded research programs in the field of agricultural chemicals by the Geigy Company in Switzerland, Shell in Holland and England, Bayer in Germany, Pest Control Ltd. in England and Africa, I.C.I. and Crop Protection Ltd. in England to name but a few, are certain to yield continuing contributions to the field.

Even though it is repetitious to say that the European scientists started a revolution in the field of insecticidal chemistry during the 1940's, it is true; and furthermore, their discoveries have spread to all parts of the world with profit to all people whose industries were able to capitalize on them. It was with a feeling of justifiable pride that the Continental workers gathered in Paris last September at the Congress of Phytopharmacie, to exchange their views, present results of their research, and lay plans for developing a uniform treatment of their technical problems.

U. S. Industry Develops

BEFORE proceeding with certain details of the Congress, one should note that American industry during the fast moving years of the past decade has produced valuable synthetic organic insecticides in its own research laboratories, including such products as chlordane, toxaphene, aldrin, dieldrin, heptachlor, dilan, allethrin, isodrin, endrin, malathon, EPN, and many others. In addition, the American grower has enjoyed the benefits of American production of DDT, parathion, BHC, lindane, rhothane, TEPP and other insecticides which originated in Europe or were derived from our research as variations of the initial compounds.

These accomplishments are a lasting tribute to you men in the industries represented in the NACA. During this period, European scientists have had an opportunity to experiment with products of our industry. It is obvious that we have entered a "one-world" status insofar as pesticide development is concerned. There are no territorial boundaries within the free world on the exchange of scientific information even though the availability of particular products may be regulated by economics and trade barriers. From the viewpoint of the research scientist, wherever he may be, there is a desire to evaluate any given chemical that may do a job in pest control.

The Paris Congress was attended by approximately a thousand people representing more than twenty countries. The majority came from western Europe and England, although many areas of the free world were represented. Workers from the United States, although few in number, represented the U. S. Department of Agriculture, various industries, experiment stations and the American Association of Economic Entomologists.

Since this past Congress was only the third one to be held, it is evident that the interest and participation in the next Congress in 1955 will be more widespread. Reports covering all papers, reports and workings of the committees will be available this spring and can be purchased from the Secretary of the Congress.

Broad Program Featured

THE program contained sections that dealt with methods of chemical analysis, physical and chemical studies, testing procedures for evaluation of the efficiency of insecticides, fungicides, weed-killers and plant growth regulators. Other sections dealt with the mode of action and toxicity of insecticides, rodenticides, and corvicides, with a companion section covering similar topics relating to fungicides and herbicides. An extensive demonstration of application equipment was staged by the Congress with exhibits of various types of sprayers, dusters, fixed wing plane and helicopter application, fumigation equipment, etc. The large attendance and interest in this part of the program indicated the keen awareness of European workers of the need for improved application machinery. A special low-speed dusting plane of original design was demonstrated. Several color movies dealing with the application of agricultural chemicals were well received.

Still other sections of the program dealt with economic problems, toxicology of pesticidal chemicals to warm blooded animals and legislation. Definite attention was directed toward a discussion of destruction of parasites and predators and the resistance of insects to insecticides. A guest lecture by Dr. Muller, Geigy Company Nobel Prize winner, reviewed the outlook for organic in-

secticides and other guest speakers covered benzene hexachloride, antibiotics and growth substances in crop protection; a discussion of systemic insecticides by Drs. Ripper and Hartley attracted widespread attention. These topics are mentioned to point out that our European colleagues are working on problems similar to ours and that they are sharing their views, problems, information and future planning at the scientific level. It is to be hoped that in future years, more workers from the U. S. can attend and participate in meetings of this sort. It is through a better understanding of the problems and an acquaintance with the individual workers, that we will make progress in our respective fields of interest.

In conjunction with the conference papers and committee meetings, symposia, etc., many of the companies participated in a trade show, exhibiting their product literature, leaflets, displays, technical publications and the like. One gets the impression that technical service by European industries is definitely a part of their program. The trade publications in England and Europe are doing good work in the educational field.

It was gathered from discussions with publishers of trade journals that they are interested and anxious to have technical articles dealing with American products for publication in their magazines. It would be difficult to overemphasize that there is a keen desire on the part of all workers with whom I talked for information relating to our products and developments.

U. S. Growers Informed

AS one has the opportunity, he compares outside developments with those of his own country. The American farmer has a better individual understanding of pest control problems than any farmer in the world. This favorable position in large measure is due to the extensive educational background in the pest control field that has been developed by the agricultural experiment stations, the agricultural extension service at the federal, state and county levels and the technical assistance provided by the agricultural chemical industries of this country.

Years of practical experience in insect and disease control have given him the practical experience and confidence that he needs to do his job. U. S. developments in pest control reflect one phase of our advance in agricultural technology and production. We have been fortunate in having industries that could turn fundamental discoveries into practical results. We must keep a careful watch on the need for supporting and stimulating fundamental research in America along with our practical, day-to-day operations.

Many of the real discoveries in several fields of endeavor have come from European workers. They are still pushing back the frontiers in basic research on pesticides. Since our future welfare is dependant on it, it is sincerely hoped that increasing emphasis on basic research will be supported by American industry, educational institutions and government.

American Laws Rigid

ONE phase of American procedure of special interest to Continental and English workers, is our legislation regulating pesticide use and movement. In the U. S., legislation limits the uses, product claims, residues, etc., pertaining to insecticides much more rigidly than does present legal control abroad. For example, in England, the systemic insecticide Schradan, has been used commercially on food crops for several years. The manufacturer bears the responsibility for its safe use. Similar uses of systemics on food crops have taken place in Europe and Africa. In the United States, the use of systemic insecticides thus far has been limited, except for research purposes, to non-food crops.

Hartley, Heath, Park, Hanna and others of Pest Control Ltd. presented papers at the Congress based on research with systemic insecticides having a radio-active element in their formulation; these workers are contributing as much, if not more, fundamental information than any other group to the mode of action and fate of systemics in plants.

Registration of pesticides in England is a voluntary matter and a firm that registers its products is permitted to use the emblem on the package indicating national registration. In England, there is wide use of custom application of agricultural chemicals. This permits more direct control over application rates and safety practices during application than American manufacturers may be able to exercise.

Firms such as Pest Control Ltd. are exercising extreme precaution by using filtered air for the tractor drivers during the application of pesticides, cholinesterase determination in blood from workers applying phosphate insecticides and other safety measures. They are carrying on fundamental biochemical research directed toward determining the fates of systemic insecticides in plants as well as toxicity of intermediate products of metabolism of these compounds.

One gains the impression that a weather eye is being cast on our legislative procedures designed to regulate pesticide use since they may some day serve as a pattern for future consideration by other governments. At present, if BHC is used in Europe for pest control on root crops, and an off-flavor is found in the commodity at harvest, the matter of sale is largely one of finding consumer acceptance.

In developing legislative procedures to regulate pesticides in Europe, one must keep in mind that there are a number of separate countries bordering each other where America has states in a similar geographic area. It is easier to regulate our activities through federal legislation than it is to get all of the separate European governments to subscribe to a uniform procedure.

Application Equipment

DEVELOPMENT of application equipment in Europe is following along well-established lines. The

(*Turn to Page* 130)

Midwestern dealer and good customer get their message across by using

Fertilizer Sign Language

by
Lloyd Dumenil
Agronomist
Iowa State College
Ames, Iowa

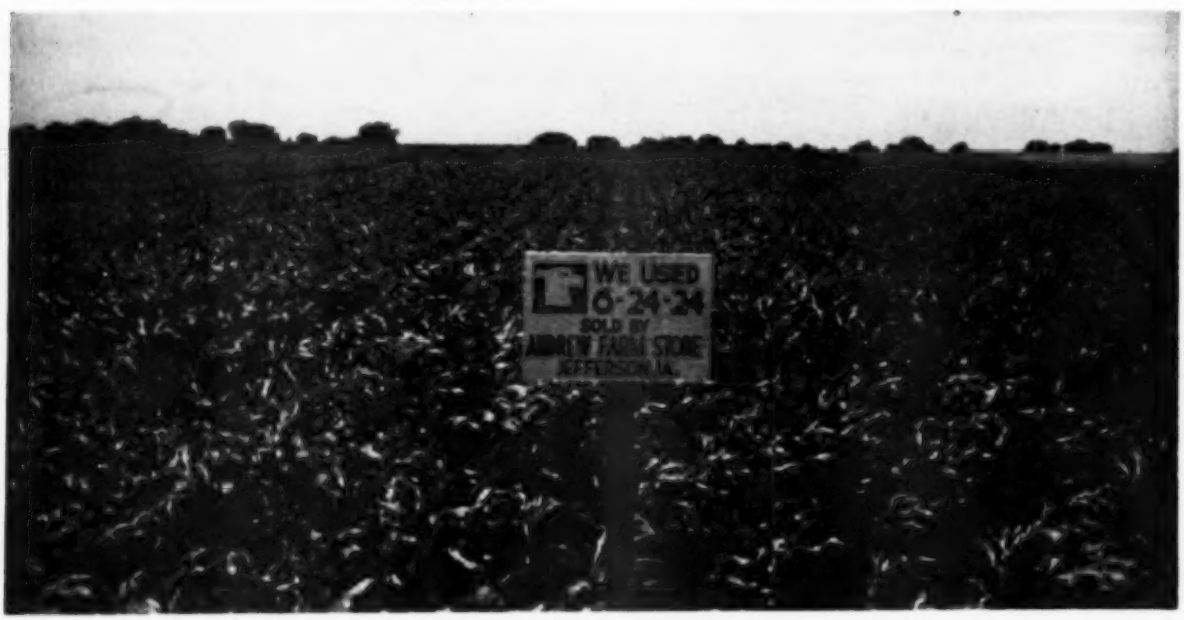
A NEW method of making the public conscious of the part played by fertilizer in the production of better crops has been tried with considerable success in Greene County, Iowa, where a farm store located in the county seat erected signs to tell all comers that fertilizer application pays.

Kenneth Kinsman, of the Andrew Farm Store in Jefferson, Iowa, was discussing business with a representative of the Mathieson Fertilizer Co., Paul Jeffers, when the two touched on the subject of publicity . . . how the local store could expand its sphere of influence in the community and make its name better known throughout the county.

Mr. Kinsman had observed that certain companies in other lines had marked their fields for a number of years, calling to the public's attention the fact that such-and-such a product was being grown here. "Why don't we label the fertilized fields to call this to the attention of other farmers?" asked Mr. Kinsman. "Then they could see for themselves the increased fertility of the soil."

With such a start, plans were drawn up for a number of signs, arrangements made for their painting, and about a dozen of them were erected early in the summer, on a trial basis.

The plan worked. Much local interest was aroused and the signs received a great deal of attention. James Andrew, owner of the store, said that in addition to making an impression on the local folks, favorable comments



Below: This cornfield received 70 pounds per acre of 6-24-24 with a planter attachment. Picture taken June 5. Sign telling story attracted attention of entire neighborhood.

Top photo: Paul Jeffers, Mathieson Chemical Co. representative (left) and Jim Andrew, owner of Andrew Farm Store, who cooperated in fertilizer sign idea.

Second photo: Sign tells all comers that grower Howard Higgins had used 13-39-0 on his 50-bushel oats field. Sign informs passing neighbors why field was good.

Third picture: Here is the fertilizer response noted by Kenneth Wilson's neighbors as they inspected his cornfield on July 11. The corn on the right had received 70 pounds per acre of 6-24-24.

Lower photo: Paul Wells was happy with results from 100 pounds per acre of 13-39-0 on this field. His yield of 50 bushels was well above the average of neighbors who failed to apply fertilizer. — And they recognized this fact!

were received from people in other counties from 30 to 40 miles away. "Many of them wanted to know the amount of fertilizer used on those fields," he said, and added that this information would be included on future signs.

Neighbors of the farmers on whose properties the signs had been placed, were found to be quite observant. They had commented about the marked difference that the starter fertilizer made on farmer Wilson's cornfield. Variations had occurred because Mr. Wilson had run out of fertilizer at the end of the field near the highway, and to the observer, the difference was very obvious. The sign told the story of why most of the corn was of superior height.

Neighbors also noticed the lush oats fields where the signs were placed. Most of these fields yielded about 50 bushels per acre as against from 25 to 35 bushels harvested from the unfertilized plots. None of the marked fields had unfertilized strips along the highway, but at the other end of the field, near a side road, the fertilizer had run out and the difference was spectacular. "My neighbors looked over the farm from a side road, noticed that poor strip of oats, and wanted to know what happened," farmer Howard Higgins said. He reported that when the oats had been combined, there was twice as much

(*Turn to Page* 139)

325 in attendance at St. Louis
at first annual convention of

North Central Branch,

PROBLEMS involving fruit insects, pollinating insects, vegetable and field crops insects, as well as stored products pests were discussed in a series of eleven sessions held during the first annual conference of the North Central Branch of the newly formed Entomological Society of America, held March 19 and 20 in the Hotel Statler, St. Louis, Mo. Dr. Charles Palm, Cornell Univ., Ithaca, N. Y., president of the national association presented to the membership the aims of the organization, discussing in particular the question of publication of entomological papers, the admission of students to membership at a special rate, and pointing out that the new society will consider all phases of entomology, including both the practical and theoretical aspects. H. H. Ross, Illinois Natural History Survey, Urbana, Ill., was introduced as the president-elect of the national group for the forthcoming term.

More than 325 registrants of the North Central branch voted to elect George C. Decker, Illinois State Natural History Survey, Urbana, Ill., chairman for 1953, succeeding T. H. Parks, extension entomologist of Columbus,Ohio, who will now serve on the executive committee. T. C. Allen, Univ. of Wisconsin, was elected vice-chairman, succeeding Paul Dahm of Kansas State College; and R. W. Rings of the Ohio Experiment Station, Wooster, Ohio was elected secretary-treasurer to succeed J. W. Apple of the Univ. of Wisconsin, Madison. Dr. Apple was elected as representative on the governing board. H. H. Harris, McConnon & Co., Winona, Minn. was elected to serve three years on the executive committee, and R. Hutson, Michigan State College,

Paul Dahm

Photo Below

L. to R.): Claud Neiswander, Ohio Agricultural Experiment Station, Wooster; J. H. Bigger, Illinois Natural History Survey, Urbana, chairman of the auditing committee; R. Hutson, Michigan State College, East Lansing, newly-elected to executive committee; L. Jenkins, University of Mo., chairman of local arrangements committee; and L. K. Cutkomp, University of Minnesota, St. Paul, chairman of program committee.

E. S. A.

East Lansing, to serve one year on the executive committee.

Opening the symposium on insect resistance to chemicals, W. N. Bruce, Natural Hist. Survey, Urbana, Ill., reported that in a field study, all strains of houseflies tested showed resistance to DDT, methoxychlor and toxaphene. He indicated also that tests with various insecticides indicated that compounds which are good dehydrochlorinators produced better knockdown than insecticides having no dehydrochlorinating action. W. R. Horsfall, Illinois Dept. of Entomology, Urbana, summarized the mosquito problem with the following three points for control: (1) reduction of larval sites; (2) application of chemicals to sources of feeding; and (3) obtaining reliable survey data by which to follow possible larval sites and feeding grounds. In discussing resistance of plant-feeding pests, B. A. Porter, USDA, BEPQ, indicated that whereas it is well known that some pests do resist certain chemicals, there has been, as yet, no report of resistance to oil sprays. Ralph Heal, National Pest Control Association, N. Y. reviewed the resistance problem of household and industrial pests.

T. C. Allen

In a brief session on new equipment and new insecticides, W. C. Slavens, John Bean Div. Food Machinery Corp., Champaign, Ill., reported a new sprayer for the pest control operator, having a five-gallon capacity and either gas or electric operated; T. E. Bronsen, Amer. Scientific Laboratories, introduced a treadle-sprayer designed for livestock. R. Hamman of Shell Chemical Corp., Denver, indicated that the insecticide endrin which has been used successfully against cutworm, army worms, the cotton boll weevil, forest insects, cabbage insects, tomato insects and chinch bugs, will be available commercially in 1953.

In discussing the new phosphate compound, diazinon, C. C. Alexander, Geigy Co., Inc., Bayonne, N. J., reported that this insecticide has shown good results against flies in New Jersey barns, having a residual activity of three months, and that further studies are being made against agricultural pests. The compound has an LD50 to rats of about 100 mg/kg, and although no toxic effects were observed in the application work done to date, it is advised that all precautions for handling toxic spray materials be observed. E. Swisher of

Photo Below

L. to R.): J. W. Apple, Univ. of Wisconsin, elected to governing board; George C. Decker, Illinois Natural History Survey, Urbana, Illinois, chairman; Charles E. Palm, Cornell University, Ithaca, N. Y., ESA president; T. H. Parks, extension entomologist, Columbus, O., executive committee; and R. W. Rings, Ohio Agricultural Experiment Station, Wooster.

Protection of stored grain; control of European corn borer; better methods of application; and recommendations for insecticidal material discussed at meeting

Rohm & Haas, reviewed studies on "Rhothane," a contact stomach poison which may warrant increased attention, since its cost is about one-third that of methoxychlor, and it may pass F.D.A. requirements for use on livestock. The compound has been tested against the horn fly, vegetable insects, garden and household insects. It has been found ineffective against DDT resistant flies.

Considerable interest was shown in aerial insect control, and T. H. Parks, reported that the plane is well adapted to control most pests, including spittle bugs, lygus bugs, grasshoppers, sweet clover weevils, alfalfa weevils and aphids. He said further that various insecticides have been applied in such sprays: DDT about 1½ #/acre; chlordane, 1#; toxaphene 1½# etc. The approximate cost where BHC is used is $2.50 to $3.00 per acre, including material. Dr. Parks pointed out that, basically, specially designed planes are needed for agricultural use. Those used currently are converted commercial or ex-government planes, and are not entirely adapted for most efficient insecticide application. He said that other disadvantages of aerial application are the inability to obtain immediate service when needed, and the weather factor, determining time of application.

Insecticide application data comparing ground and aerial treatments of field corn, presented by H. B. Petty, Univ. of Illinois, indicated that corn borer control is likely to be better by ground application of insecticides. Aerial and ground sprays were both satisfactory in application of dieldrin to control chinch bugs.

H. B. Petty

Aerial applications of 1½# DDT/acre gave good results in control of *Diabrotica* beetles. Other comments on aerial insecticide application conceded a general advantage in treatments of large acreages.

E. H. Fisher of the University of Wisc., indicated that aerial treatment of ear worm, corn borer and pea aphid is about as efficient as ground treatment. Late treatment of potatoes by plane is preferred to ground application, since this avoids damage of vines by applicators. According to Dr. Fisher, still another consideration in aerial insect control is the elimination of any investment in application equipment.

In line with the investigation of new developments Claud Neiswander, Ohio Agricultural Experiment Station, Wooster, presented an expose of the UKACO machine, which he reported proved completely ineffective in any of the tests made. Four or five treatments of a single field by a representative of UKACO gave no indication of control. (A complete analysis of this unit was reported in the January 1952 issue of *Agricultural Chemicals*.)

Protection of Stored Grain

THE question of grain sanitation and the food law was considered in several sections during the course of the meeting. Whether responsibility lies with the farmer or the elevator seems to be an important question to be decided. Representatives of the 14 north central states reported on the status of the law and problem in their respective states, the general trend being to concentrate on the farmer to provide clean grain.

Roy S. Pruitt, U. S. Food & Drug Administration, St. Louis, stressed the importance of clean grain, pointing out a loss of more than $4,000,000 annually due to destruction of grain by insect and rodent pests. He indicated that only about 38% of the grain arriving at mills is free from infestation, and that cleaning procedures used in 16 mills are relatively ineffective. Another comment indicated that often newer and better constructed elevators are needed to meet current requirements, and that both the farmer and elevator need to cooperate in producing a satisfactory food product.

An analysis of sprays for wheat bins indicated that carbon tetrachloride, methyl bromide, and ethylene dichloride can be used satisfactorily if adequate ventilation is available. Although spraying bins with DDT is effective, and there has been no direct evidence to indicate danger, the practice is not recommended generally. Dr. Pruitt indicated that there is no objection to the use of DDT oil solution residual sprays, or lindane oil solution sprays, if care is taken to prevent contact of sprayed bins with finished flour.

In a report on "Pyrethrum Combinations as Protectants for Stored Grain," H. H. Walkden, BEPQ, Manhattan, Kansas, reviewed a series of tests using synergized pyrethrins in both dust and spray forms, and evaluated under conditions of farm storage. Harvest applications of the synergized pyrethrins to wheat as it came from the combine gave good protection from insect attack in farm storage during the period of July to November. The application consisted of 1 ppm of pyrethrins and 14 ppm of synergist (compounds tested were piperonyl butoxide, n,-propyl isome, sulfoxide, and MGK 264.)

(*Turn to Page* 111)

Prospect for 11% increase in Fertilizer Supply

IN a supplemental report on the fertilizer situation for 1952-53, L. G. Porter and M. M. Johnson, Production and Marketing Administration, U. S. Department of Agriculture, Washington, D. C., estimate the quantity of the three primary plant nutrients to be increased approximately 11% over the 1951-52 total. According to the revised estimate, the quantity of nitrogen, phosphate and potash for the 1952-53 season is 5.815 million tons as compared to the 1951-52 total of 5.245 million tons.

A breakdown of the supply situation for the three major elements is presented by the U. S. D. A. as follows:

Nitrogen (N)

The revised 1952-53 estimated supply of nitrogen (N) is 1.660 million tons, representing an increase of 4.7 percent over the September, 1952 estimate and 16.5 percent more than the 1951-52 supply. Details for 1952-53 are shown in Table 1.

Phosphates (P_2O_5)

The revised 1952-53 estimated supply of phosphates in terms of available phosphoric oxide (P_2O_5) is 2.410 million tons, representing a 2.2 percent decrease from the earlier estimate, but remaining above the 1951-52 supply by nearly eight percent. Details for 1952-53 are shown in Table 2.

Potash (K_2O)

The revised estimated 1952-53 supply of potash in terms of potassium oxide (K_2O) is 1.745 million tons. Although reflecting some decrease from the earlier forecast, the revised estimate is about 10 percent more than the 1951-52 supply. Details for 1952-53 are shown in Table 3.

A report based upon trade deliveries of nitrogen, phosphates, and potash during 1952-53 and a forecast of the 1953-54 supply is scheduled to be issued after the close of the current season, the U.S.D.A. indicates.

TABLE 1
Nitrogen For Fertilizer Purposes[1]
(In Short Tons of Nitrogen)
United States And Possessions

Source	1951-52[2] Supply (Trade Delivery Basis)	1952-53 Estimated Supply[2]	Increase or Decrease	Percent Increase or Decrease
Ammonium Nitrate	355,000	395,000	40,000	11.3
Ammonium Sulfate	302,000	382,000	80,000	26.5
Other Solids	222,000	245,000	23,000	10.4
Natural Organics	40,000	39,000	— 1,000	— 2.5
N Solutions Compound	300,000	319,000	19,000	6.3
NH_3 for Ammoniation	35,000	25,000	—10,000	—28.6
NH_3 for Direct Application	171,000	255,000	84,000	49.1
TOTAL	1,425,000	1,660,000	235,000	16.5

1 Source: OMF, PMA-U.S. Department of Agriculture.
2 These figures include the net impact of exports vs. imports.

TABLE 2
Phosphate For Fertilizer Purposes[1]
(In Short Tons of Available P_2O_5)
United States And Possessions

Source	1951-52[2] Supply (Trade Delivery Basis)	1952-53 Estimated Supply[2]	Increase	Percent Increase
Normal Superphosphate	1,681,000	1,712,000	31,000	1.8
Concentrated Superphosphate	323,000	467,000	144,000	44.6
Wet-Base Goods	15,000	[3]	.....	.....
Other	216,000	231,000	None	None
TOTAL	2,235,000	2,410,000	175,000	7.8

1 Source: OMF, PMA-U.S. Department of Agriculture.
2 These figures include the net impact of exports vs. imports.
3 Wet-base goods are included in normal superphosphate.

TABLE 3
Potash For Fertilizer Purposes[1]
(In Short Tons of K_2O)
United States And Possessions

Source	1951-52[2] Supply (Trade Delivery Basis)	1952-53 Estimated Supply[2]	Increase	Percent Increase
Muriate of Potash	1,446,000	1,585,000	139,000	9.6
Sulfate of Potash and Potash Magnesia	103,000	115,000	12,000	11.7
Manure Salts	2,000	2,000	None	None
Other	34,000	43,000	9,000	26.5
TOTAL	1,585,000	1,745,000	160,000	10.1

1 Source: OMF, PMA-U.S. Department of Agriculture.
2 These figures include the net impact of exports vs. imports.

Food and Drug Residue Tolerances May Become Reality Soon!

AT long last the Food and Drug Administration shows signs of issuing its report on the insecticide residue tolerance hearings held back in 1950. According to the Washington grapevine, the report will be in two sections—Proposed Findings of Fact, and a Proposed Order. The latter would presumably incorporate the suggested tolerances. The report is said to be in the "signature stage" at the moment, and may be ready for announcement within the next few weeks. FDA would then presumably allow a period of perhaps sixty days for the filing of written exceptions. After these were considered, the final order would then be drafted.

* * *

And the sixty-four dollar question is, having taken over two years to act on the tolerance hearings, how could the FDA be expected to handle the additional responsibilities which would be given to them under the proposed Delaney bill, HR-2245?

* * *

Washington opinion seems to indicate that if any new pesticide legislation is adopted at this session of Congress, or in a later session, it will more probably be the new Miller bill, HR-4277, rather than the Delaney bill. A companion bill to HR-4277 is expected to be introduced in the Senate shortly. Meanwhile, farm organizations, agricultural producers, research agencies, and pesticide manufacturers are rallying behind the Miller bill. As contrasted to the proposed Delaney measure, the Miller bill recognizes that pesticides are normally used in food production as a matter of necessity rather than as a matter of choice.

Many of those who attended the Delaney hearings will be interested to know that Vincent A. Kleinfeld, chief counsel for the Delaney Committee, is resigning from the Department of Justice April 30th to re-enter private practice.

* * *

Scenic note—While legislators on Capitol Hill consider these problems of agricultural chemical use, employees of the National Park Service were busy about the Tidal Basin in early April energetically spraying the cherry blossoms with a naphthalene acetic acid preparation in the hopes of making the blossoms last another week so there would still be some on the trees for the annual Cherry Blossom Festival.

* * *

At the USDA, interest is concentrated on two points—how severe will the Department's budget cut be, and what will be the results of the proposed reorganization of the USDA? Secretary Benson's program for reorganization follows closely along the lines of the suggestions made in the Hoover Committee report. The objective is to streamline the Department, to simplify its operations and make them more effective. Administration of its programs would be brought closer to State and local levels. In the streamlining procedure, all agencies and bureaus would be lumped under four major groups. The BEPQ would presumably come under Group 2, which deals with research, extension and land use.

* * *

Under proposed budget cuts for the USDA (about 10% across the board) some of the control programs conducted by the BEPQ might have to be cut. Programs on peach mosaic and phony peach would have to be completely abandoned, while those on Jap beetle and sweet potato weevil would be severely reduced. Sufficient funds would remain so that on the latter two pests the Bureau could continue making its surveys, but states would have to conduct their own quarantines.

* * *

Reverting back to possible reorganization of the BEPQ, it is possible that as suggested in the original Hoover Report, activities of the Bureau might be broken down on a crop rather than on an insect basis. Most practical entomologists look on such a possibility as a definite backward step. As a matter of fact, with any organization operating as well as the BEPQ has over a long period of years, tinkering of any kind is dangerous. It might be better with this agency to leave well enough alone.

* * *

The Federal Trade Commission has adandoned its plans to hold a trade practice conference for chemical soil conditioners this spring. The FTC, which has been reviewing advertising claims made for these new products, originally planned to hold such a conference, but now finds it impracticable, since there is not sufficient time to permit adequate consideration and appraisal of the results obtained through use of the various products.

* * *

Though the lull in shipments of agricultural insecticides has persisted for a dangerously long period, and still continues to arouse concern, —fertilizer shipments are now reported to be showing the normal expected seasonal increase. Slow movement of fertilizer earlier in the year gave occasion for considerable worry, but shipments are now reported picking up. There is some optimism now that despite earlier slow movement, new consumption records may be looked for in the fertilizer consump-

(*Turn to Page* 109)

Chemical Characteristics of Phosphorus Compounds to kill Aphids & Spider Mites by Systemic Action

by

E. E. Ivy

U.S.D.A., Agr. Res. Adm.,
Bureau of Entomology and Plant Quarantine,
College Station, Texas

SINCE 1949, hundreds of compounds have been screened for systemic activity at the College Station, Tex., cotton insect laboratory, operated cooperatively by the Bureau of Entomology and Plant Quarantine and the Texas Agricultural Experiment Station. Procedures used in these screening tests have been described previously (Ivy 1952).

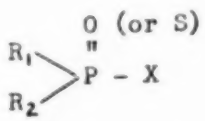
Among the first highly effective systemic insecticides were salts containing selenium. Selenium, however, is a stable element and more toxic to rats than arsenic (Franke and Moxon 1936). Selenium compounds, therefore, cannot be recommended for use on food crops.

Certain fluoroethyl compounds have received attention as systemic insecticides, particularly in Europe. These materials also are extremely toxic to rats and mice—an outstanding example is the rodenticide 1080—and are thus not promising for use on food crops.

Another group of compounds exhibiting systemic activity are the organic phosphorus compounds. All of the successful systemic insecticides belong to this group, and these are the materials that have been studied most intensively.

Not all of the phosphorus compounds have systemic properties. One of our objectives has been to determine what characteristics a phosphorus compound must have to be a systemic insecticide. This article will discuss the chemical characteristics of phosphorus compounds that kill aphids and spider mites by systemic action. Compounds that kill chewing insects by systemic action will be discussed in a subsequent article.

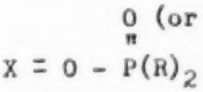
Phosphorus compounds possessing insecticidal properties have the general formula (Schrader 1951)



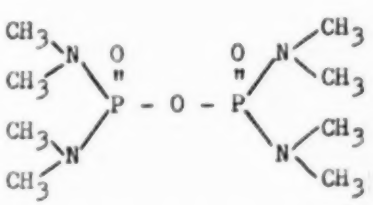
where R_1 and R_2 are alkyl, alkoxy, or alkylamino groups stably linked to phosphorus and X is an acid group. The P-X link has the character of an acide anhydride.

Not all of the toxic phosphorus compounds have systemic activity against aphids and spider mites. In fact, only a small number have this property. This work is far from complete, but systemic activity against mites and aphids seems to be associated with certain anhydride linkages. Linkages that confer systemic activity will be described below.

Linkage to Another Phosphorus Atom



The outstanding compound of this class is:



Octamethyl pyrophosphoramide (schradan) (1)

This compound has come into commercial use, particularly in Eng-

Report of a study made under the Research and Marketing Act of 1946, in cooperation with the Texas Agricultural Experiment Station.

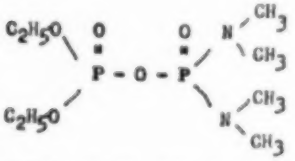
The following manufacturers supplied the experimental compounds in this paper: Monsanto Chemical Company, 1, 4, and 5; American Cyanamid Company, 9, 10, 11, 12, 13, and 14; Pest Control, Ltd., 8, 15, 16, 17, 18, 19, and 22; Shell Oil Company, 20 and 21; Farbenfabriken Bayer Company, 23, 24, 25, 26, 27, 28, 29, and 30.

land, where it is marketed in a formulation known as Pestox III.

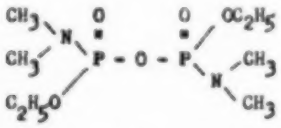
In laboratory tests with cotton seedlings (Ivy *et al.* 1950) we obtained complete kill of spider mites with 1 part of schradan per million parts of nutrient solution. For complete kill of cotton aphids 6 p.p.m. were required. In soil tests in which a solution of the compound was sprinkled on the soil in which cotton plants were growing, a dosage of 8 to 16 pounds per acre was required for mite and aphid control. The soil treatments gave several months' protection. One application, at the rate of 25 pounds per acre, gave perfect protection against spider mites and aphids for seven months, even though the plants were continually subjected to reinfestation.

When applied as a spray to cotton plants, 1 pound per acre gave protection for two to four weeks, depending upon the rate of growth. The method that requires the least material is seed treatment. When 1 pound was applied as a seed soak to 100 pounds of seed, plants grown from this seed continued to kill mites and aphids for six weeks following germination.

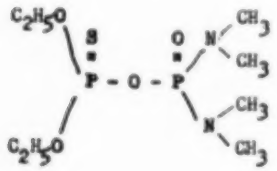
Other compounds similar in structure and systemic activity to schradan are:



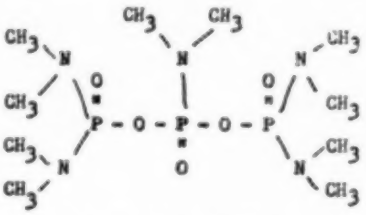
O,O-Diethyl *bis* (dimethylamido) pyrophosphate, *unsymmetrical* (2)



O,O-Diethyl *bis* (dimethylamido) pyrophosphate, *symmetrical* (3)



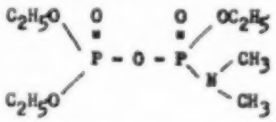
Diethoxythiophosphoryl tetramethyldiamidophosphate (4)



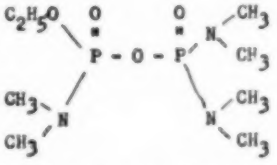
Decamethylpentamidotriphosphate (5)

All these compounds were less effective than schradan when tested as systemic insecticides against aphids and spider mites. Slightly higher dosages were required for control, and the treatments did not remain effective for so long a time.

Schrader (1951) describes two related compounds that have systemic properties.



O,O,O-Triethyl dimethylamido pyrophosphate (6)



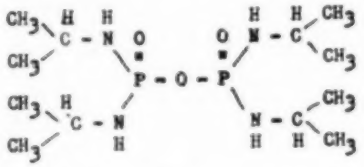
O-Ethyl tri (dimethylamido pyrophosphate (7)

Tetraethyl pyrophosphate (TEPP) was tested for systemic properties with negative results. Negative systemic activity could have been predicted for this compound because of its instability in aqueous solution and, as Hartley (1951) has pointed out, stability is a requirement of a successful systemic compound.

Another compound of this class that has been tested for systemic properties with negative results is tetraethyl dithiopyrophosphate. It is reported by Schrader (1951) to be quite stable. Tetraethyl dithiopyrophosphate has very low water solubility, which may be the reason for its failure to have systemic activity. Hartley (1951) states that water solubility is a requirement of a systemic compound. As is well known, however, there are no completely insoluble compounds. Some of the very effective systemic insecticides to be described presently seem to have very low solubilities. We are inclined to believe that even the least soluble materials are sufficiently soluble to be absorbed by plants and translocated in the sap stream if other requirements for systemic activity are met. Failure of tetraethyl dithiopyrophosphate to have systemic properties, therefore, remains an enigma at our present state of knowledge.

Tetramethyl dithiopyrophosphate and tetra-*n*-propyl dithiopyrophosphate also showed no systemic activity. We have no information concerning the stability of these compounds.

Another pyrophosphate that has systemic activity is:

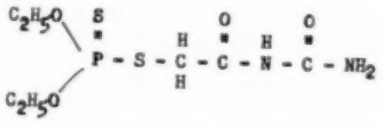


Tetra (monoisopropyl) pyrophosphate (8)

This compound was less active systemically than schradan.

Linkage to sulfidoacetylurea group ($X = SCH_2CONHCONH_2$)

The outstanding compound of this class is:

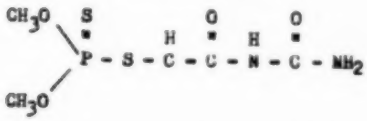


alpha-Diethoxyphosphinodithioacetylurea (9)

In nutrient-solution tests this compound has six times the systemic activity of schraden against aphids, but was ten times as active against spider mites. It was much more active than schradan when applied as a

spray, or as a seed treatment. It was not so long lasting in the soil application experiments, however. In a test in which schradan was still effective seven weeks after application to the soil, this compound retained its effectiveness only four weeks.

A similar compound is:

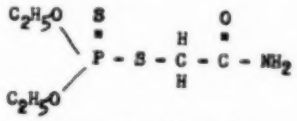


alpha-Dimethoxyphosphinodithioacetylurea (10)

It will be noted that this compound is the dimethyl homolog of (9). It had less systemic activity than the ethyl compound. This is in line with observations by Schrader (1951) and Metcalf and March (1949) that substitution of ethyl by methyl groups lowers the insecticidal activity of various alkyl-substituted thiophosphoric acid derivatives. Compound (10) was about equal to schradan in the nutrient-solution tests, was superior as a seed treatment, and was effective for a shorter time as a soil treatment.

Linkage to sulfidoacetamide group ($X = SCH_2CONH_2$)

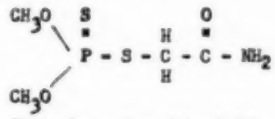
The most effective systemic insecticide of this type yet found is:



Diethoxyphosphinodithioacetamide (11)

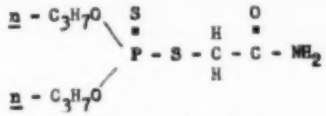
This compound had only one-tenth the systemic activity of the corresponding acetylurea compound (9).

Another compound of this type with less systemic activity is its dimethyl homolog:



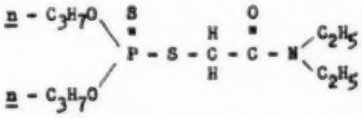
Dimethoxyphosphinodithioacetamide (12)

The normal-propyl derivative had still less systemic activity:



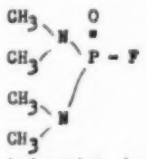
Dipropoxyphosphinodithioacetamide (13)

There was no apparent difference in the activity of this compound and a derivative produced by substituting ethyl groups for hydrogen on the amino nitrogen:

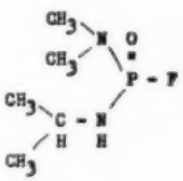


N,N-Diethyl dipropoxyphosphinodithioacetamide (14)
Linkage to fluorine (X = F)

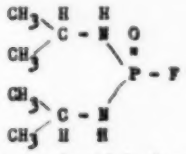
The first organic phosphorus systemic compounds synthesized by Schrader were anhydrides of hydrogen fluoride and various alkyl phosphates. There are many compounds of this type, of which only a few have been tested in this country. They are more volatile than corresponding compounds containing the pyrophosphate nucleus. In fact, those examined thus far are so volatile that they are not effectively translocated when applied to foliage, and must accordingly be used as soil or seed treatments. The examples that we have seen are more effective than schradan against aphids and spider mites, but are more phytotoxic. These compounds, in decreasing order of systemic effectiveness, are:



bis (Dimethylamido) phosphoryl fluoride (15)

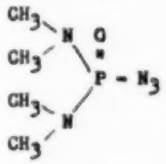


Dimethylamido (isopropylamido) phosphoryl fluoride (16)

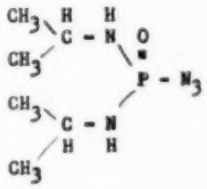


bis (Isopropylamido) phosphoryl fluoride (17)
Linkage to triazo group ($X = N_3$)

Two compounds of this type have been examined,



bis (Dimethylamido) phosphoryl azide (18)

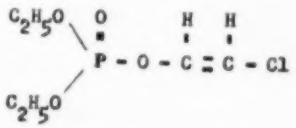


bis (Monoisopropylamido) phosphoryl azide (19)

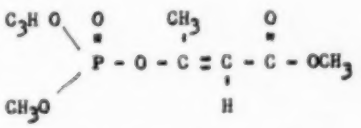
In nutrient-solution tests these compounds were more effective against the cotton aphid than their corresponding fluorides, (15) and (17).

Linkage to unsaturated aliphatic group ($X = O - C = C -$)

Three compounds of this type have been found to have a systemic property. The most effective are:



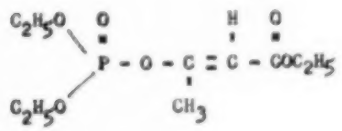
2-Chlorovinyl diethyl phosphate (20)



1-Carbomethoxy 1-propen-2-yl dimethyl phosphate (21)

These compounds were more effective than schradan against cotton aphids in nutrient-solution and seed-treatment tests. They also exhibited systemic toxicity to chewing insects, but were more phytotoxic than schradan and some of the other compounds.

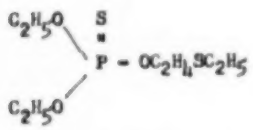
The other compound of this type is:



alpha - Diethoxyphosphinoacetoacetic acid, ethyl ester (22)

Linkage to akyl-mercapto-alkoxy group (X = OR,SR_1)

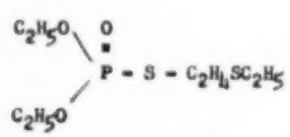
The best known example of this group of compounds is:



O,O-Diethyl, O(ethylmercaptoethyl) thiophosphate (23)

This compound is being marketed in this country in a formulation under the trade name of Systox. In nutrient-solution and seed- and soil-treatment tests it was four to eight times as effective as schradan against spider mites and cotton aphids. Following foliage application at the rate of ½ pound per acre, treated plants retained their effectiveness against spider mites and cotton aphids for two to four weeks. Approximately twice this amount of schradan was required for comparable results. In addition to systemic activity, this compound shows marked contact and vapor toxicity.

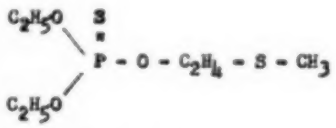
Another compound of this type is:



O,O-Diethyl S-(ethylmercaptoethyl) phosphate (24)

It is approximately three times as effective against mites and aphids as (23). However, it is more than eight times as phytotoxic to cotton plants.

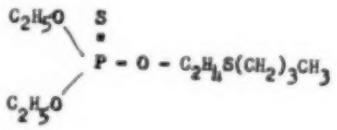
Shortening the carbon chain terminal to the sulfur atom produces:



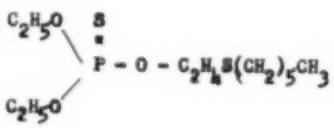
O,O-Diethyl O-(methylmercaptoethyl) thiophosphate (25)

This compound seems to have greater systemic activity than (23) against aphids and spider mites, as well as against a number of other species. It is a very promising compound.

Lengthening of the carbon chain terminal to the sulfur atom causes little change in the systemic activity of these compounds against mites or aphids. The following compounds have approximately the same activity as (23):



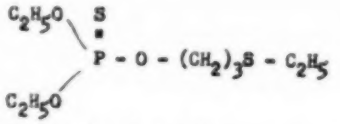
O,O-Diethyl O-(butylmercaptoethyl) thiophosphate (26)



O,O-Diethyl O-(hexylmercaptoethyl) thiophosphate (27)

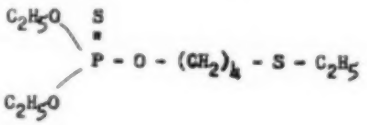
Substituents on this portion of the molecule may profoundly affect the activity of the compound, however. For example, O,O-diethyl ethylacetomercaptoethyl thiophosphate had no systemic activity against spider mites or aphids in nutrient-solution tests at 100 p.p.m.

Lengthening of the carbon chain between the sulfur and carbon atoms lowers the systemic activity of compounds of this class. Compound (28) has less activity than compounds (23) through (27):



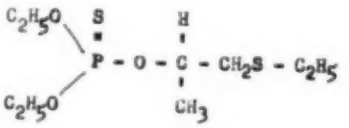
O,O-Diethyl O-(ethylmercaptopropyl) thiophosphate (28)

The following compound has still less systemic activity:



O,O-Diethyl O-(ethylmercaptobutyl) thiophosphate (29)

On the other hand, substitution has no appreciable effect on systemic activity:



O,O-Diethyl O-(ethylmercaptoisopropyl) thiophosphate (30)

Linkage to paranitrophenoxy group:

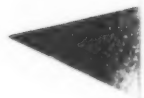
It is questionable whether true systemic activity occurs in this group of compounds. None of the materials studied thus far are translocated when applied to foliage, although some are known to be extremely active aphidicides and acaricides, and have relatively low volatility. In nutrient-solution tests some of these compounds exhibit activity. However, they are all ineffective against mites or aphids on the true leaves of seedling plants, when applied as seed treatments. On the other hand, some of these compounds, following application to the seed, retain their effectiveness against certain chewing insects to the sixth and eighth true leaf:

(*Turn to Page* 137)

benzene hexachloride (technical)

extra high gamma bhc (80)

lindane



An Important Announcement to Every Formulator

Ethyl's new plant at Baton Rouge, La. is now in production

We can now serve you more efficiently than ever.

Our new plant, America's newest and most advanced, will be devoted exclusively to the manufacture of Benzene Hexachloride (Technical), Extra High Gamma BHC (80) and Lindane.

With its large capacity, greater economy and efficiency, the Baton Rouge plant will assure you a dependable, continuing supply of these versatile insecticides. And with a choice of three, *you* can offer *your* customers the gamma formulation best suited to their individual needs and purposes.

We hope you will take advantage of our new Baton Rouge facilities and the traditional Ethyl service and cooperation that go with them. We will be happy to discuss your requirements . . . Now and for the future.

ETHYL CORPORATION

100 PARK AVENUE, NEW YORK 17, NEW YORK

ATLANTA, BATON ROUGE, CHICAGO, DALLAS, DAYTON, DETROIT, HOUSTON, KANSAS CITY, LOS ANGELES, NEW ORLEANS, PHILADELPHIA, PITTSBURGH, SALT LAKE CITY, SAN FRANCISCO, SEATTLE, TULSA, MEXICO CITY AND (ETHYL ANTIKNOCK LTD) TORONTO

ETHYL
CHEMICALS
ETHYL CORPORATION

Ethyl will supply it . . . Ethyl will help you apply it

Our new plant at Baton Rouge, La., will assure you a continuing supply of this increasingly popular insecticide. And at a price you'll find highly profitable in many formulations.

Ethyl's Lindane is 99 + gamma, white, odorless, and in crystalline form. And to help you use it most effectively, we've prepared a new booklet " 'Ethyl' Lindane." Just off the press, this 40 page, fact-filled brochure tells its applications, chemical and physical properties, methods of analysis, shipping and detailed suggestions for its use.

Simply write and request *your* copy of this useful guide and reference book. We'll send it gladly . . . and promptly.

ETHYL CORPORATION

100 PARK AVENUE, NEW YORK 17, NEW YORK

ATLANTA, BATON ROUGE, CHICAGO, DALLAS, DAYTON, DETROIT, HOUSTON, KANSAS CITY, LOS ANGELES, NEW ORLEANS, PHILADELPHIA, PITTSBURGH, SALT LAKE CITY, SAN FRANCISCO, SEATTLE, TULSA, MEXICO CITY AND (ETHYL ANTIKNOCK LTD) TORONTO

ETHYL
LINDANE
ETHYL CORPORATION

Opens new era in insect control

You'll find Extra High Gamma BHC (80), highly useful in many formulations for pest control.

It's effective in cotton dusting and spraying, in swampland mosquito control, in protecting hay and forage crops, and in forest insect control. In sprays, dusts, wettable powders it offers the farmer *double* protection — soil insurance plus quick kill. Its waste isomer residue is negligible; has low phytotoxicity—will not "burn" plants.

In processing, Extra High Gamma, a white crystalline compound, is readily soluble and compatible with standard additives. It's easy to grind . . . won't gum your mill machinery. Easier, more economical to handle, too . . . saves weight, labor, and storage space.

Like to know how *you* can put this multi-purpose insecticide to work for you? Write today for full details and samples.

ETHYL CORPORATION

100 PARK AVENUE, NEW YORK 17, NEW YORK

ATLANTA, BATON ROUGE, CHICAGO, DALLAS, DAYTON, DETROIT, HOUSTON, KANSAS CITY, LOS ANGELES, NEW ORLEANS, PHILADELPHIA, PITTSBURGH, SALT LAKE CITY, SAN FRANCISCO, SEATTLE, TULSA, MEXICO CITY AND ETHYL ANTIKNOCK LTD., TORONTO

ETHYL
ETHYL CORPORATION

Ethyl assures you quick, dependable delivery in any quantity

Our new plant at Baton Rouge, La., is in the heart of the Cotton Belt...only hours away by rail or motor freight. That means quick, dependable delivery ...in time to meet your market. Ethyl's BHC Technical is an ideal material for the formulation of cotton insecticides. A white powder containing 14-16 gamma, it's easier to grind and process.

Our modern plant stands ready to serve you.

ETHYL CORPORATION

100 PARK AVENUE, NEW YORK 17, NEW YORK

ATLANTA, BATON ROUGE, CHICAGO, DALLAS, DAYTON, DETROIT, HOUSTON, KANSAS CITY, LOS ANGELES, NEW ORLEANS, PHILADELPHIA, PITTSBURGH, SALT LAKE CITY, SAN FRANCISCO, SEATTLE, TULSA, MEXICO CITY AND (ETHYL ANTIKNOCK LTD) TORONTO

ETHYL
ETHYL CORPORATION

Outstanding Speakers Scheduled for Eighth Annual June Meeting of

American Plant Food Council

MORE than 500 fertilizer manufacturers, agricultural education and research leaders, are expected to attend the eighth annual convention of the American Plant Food Council at The Homestead, Hot Springs, Va., June 11-14, according to Paul T. Truitt, president of the Council.

An outstanding program has been arranged, featuring nationally-known authorities on farm policy, Department of Agriculture progams, agricultural production "tools" and regional agronomic information.

Rep. Walter H. Judd (R-Minn.) will be the banquet speaker on Saturday evening, June 13. He is a native of Nebraska, holds degrees from the U. of Nebr., served in World War I and is regarded as an international authority on the Near East.

The Convention will begin at 9:45 a.m. Friday, June 12, with an address by Council president Truitt. Assistant Secretary of Agriculture J. Earl Cook will follow with a talk covering many of the program changes and policies in the Department of Agriculture, particularly in the field of research, extension and land use in which he has the administrative responsibility under the reorganization program of the department.

Dr. T. K. Cowden, head of the Department of Agricultural Economics, Michigan State College, also will be among the speakers on the program for the opening day. Following his address, the Council's annual business meeting will be held.

Rep. Clifford R. Hope (R-Kan.), Chairman of the House Committee on Agriculture, will be the first speaker on the Saturday morning, June 12, program.

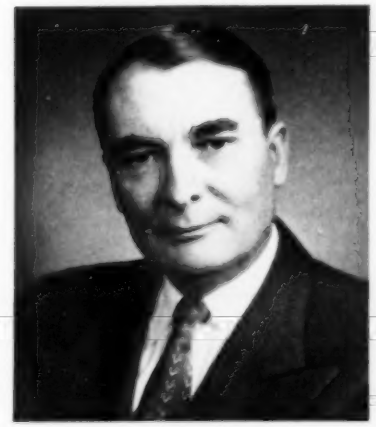
A new feature for the Convention will be the honoring of the two farm magazine editors representing the winners in the "Soil Builders Award for Editors" contest sponsored by the Council in cooperation with The American Agricultural Editors' Association. Both editors and staff members "who have rendered outstanding service as soil builders and, as such, builders of a more sound and profitable farming system," are to be honored. National judges for the contest are: Waters S. Davis, Jr., The National Association of Soil Conservation Districts; Roger Fleming, secretary-treasurer, American Farm Bureau Federation; A. C. Hale, National Vocational Agricultural Teachers Association, Inc.; Wesley Hardenbergh, American Meat Institute; Sherman Hoar, National Association County Agricultural Agents; Herschel D. Newsom, Master, The National Grange; Roderick Turnbull, editor, *Weekly Kansas City Star*.

An annual feature of the convention will be the agricultural forum on June 13. Speakers will be extension agronomists representing various sections of the United States.

H. H. Maynard, chairman of the Department of Business Organization, Ohio State University, will be the final speaker on the Saturday morning program.

(*Turn to Page* 102)

Rep. CLIFFORD R. HOPE



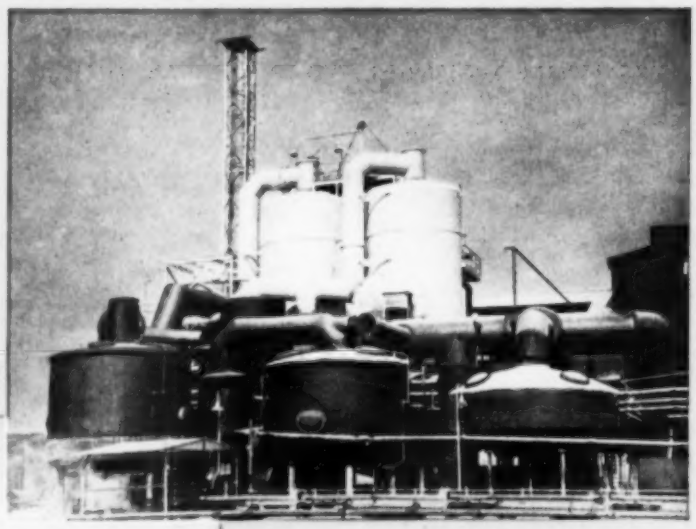
J. EARL COKE

Rep. WALTER H. JUDD

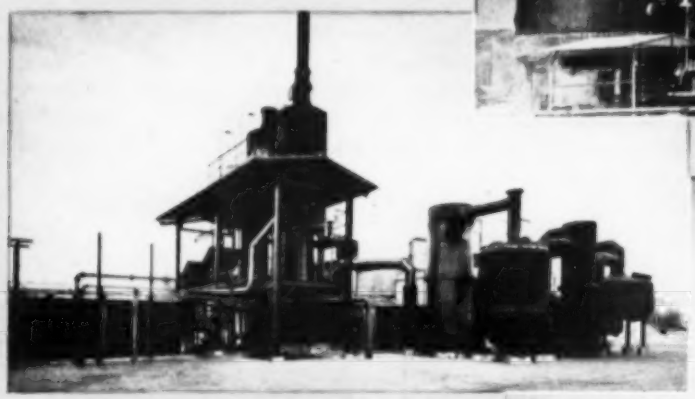
How much sulfuric acid do you need?

Among the many Chemico-built contact sulfuric acid plants in service today all over the world, one has a capacity of only five tons per day. Another produces more than five hundred tons per day. Others range in between.

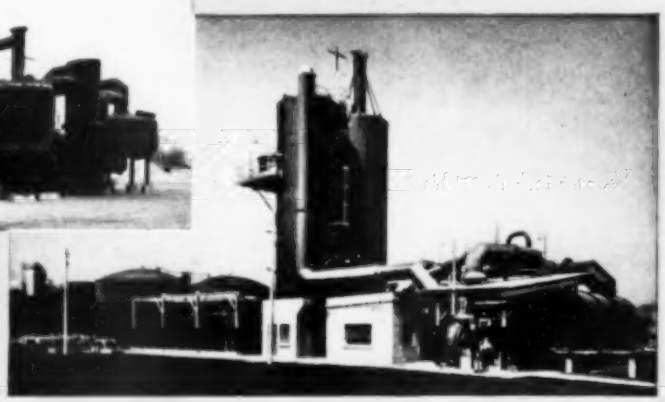
Whatever your sulfuric acid requirements are, Chemico will design and furnish you with a highly efficient plant exactly suited to your needs . . . on a one-contract, guaranteed-performance basis.



500 Tons



50 Tons



200 Tons

CHEMICAL CONSTRUCTION CORPORATION

A UNIT OF AMERICAN CYANAMID COMPANY

488 MADISON AVENUE, NEW YORK 22, N. Y.

CABLES: CHEMICONST, NEW YORK

TECHNICAL REPRESENTATIVES: CYANAMID PRODUCTS LTD., LONDON • CHEMICAL CONSTRUCTION (INTER-AMERICAN) LTD., TORONTO • SOUTH AFRICAN CYANAMID (PTY) LTD., JOHANNESBURG

Chemico plants are profitable investments

CC-343

New Miller Bill Sounds Good

— State Legislatures consider Pesticide and Fertilizer Bills

A NEW "Miller Bill," H. R. 4277, was introduced into Congress on March 26 by Rep. A. L. Miller, Nebraska, a member of the select committee which investigated the use of chemicals in the production and processing of foods in 1951 and 1952. The new Bill, different in many important respects from its author's former proposal to the 82nd Congress, has received an enthusiastic reception from industry representatives.

One of the most welcomed features of H.R. 4277 is its placing a time limitation on the Federal Security Administrator for the issuance of tolerances. A petition for establishment of a residue tolerance for a product must be acted upon within 90 days under Mr. Miller's proposal. In addition, the bill would allow recourse to the courts on grounds other than to prove that the Administrator had acted arbitrarily in his decision.

Lea S. Hitchner, executive secretary of the National Agricultural Chemicals Association, Washington, D. C., in commenting on the new bill, said it would provide even greater safety for the American food supply. He points out that Mr. Miller's proposal deals expressly with insecticides, fungicides and other agricultural chemicals and provides for the pretesting of chemicals used for the protection of various crops against pests.

Before a pesticide can be used on a food to be sold in interstate commerce, the manufacturer must prove to the satisfaction of the Federal Security Administrator the safety of the pesticide for the use intended. In addition, Mr. Hitchner also reminded, the product must be registered by the Secretary of Agriculture as provided by the Insecticide, Fungicide, and Rodenticide Act.

"These two laws, when properly enforced, serve to assure a food supply free of any objectionable residues of pesticides," he stated.

The bill is also expected to aid American growers in their use of insecticides, fungicides, and other agricultural chemicals for food production.

"Much of the uncertainty about the use of pesticides for the protection of crops will be eliminated if this new Miller Bill is adopted," Mr. Hitchner stated. He pointed out that under this bill, if the farmer uses these agricultural chemicals according to label directions, food products will not be subject to seizure due to excessive pesticidal residues. "Of course," Hitchner warned, "the adoption of this bill does not relieve the farmer of his responsibility in the proper use of pesticides."

According to the association secretary, under this amendment to the Food, Drug, and Cosmetic Act, land grant colleges will be able to issue better dust and spray schedules for farmers because the bill provides for reasonably prompt issuance of standards which establish the maximum amount of residues of pesticides permissible on or in foods.

"Furthermore, this new Miller Bill is superior to the Delaney Bill, introduced previously, to amend the Food, Drug, and Cosmetic Act," Mr. Hitchner declared, "because it clarifies many of the problems of control over the use of pesticides."

"The Miller Bill would separate pesticides from chemicals used in processing of foods and in this manner eliminate a good deal of the difficulty in the administration and enforcement of the Food and Drug Act. In addition," Mr. Hitchner stated, "the bill would provide for a recognition of the present authority of the Secretary of Agriculture under the Federal Insecticide, Fungicide, and Rodenticide Act. It would then recognize the interrelated jurisdiction of the Department of Agriculture and the Federal Security Agency."

"The bill is the first constructive approach to a highly complex problem," Mr. Hitchner commented, "and represents a recognition and understanding of the problem by Congressman Miller."

THE legislative mill was grinding on the State level, too, as this issue went to press. Some 44 state legislatures are meeting this year and of these, a considerable number are reported to be considering laws which would affect the manufacture and sale of agricultural chemicals.

Among these developments are the following:

Arkansas Senate Bill No. 171 Pesticides has passed the State's Senate and has been referred to the House Committee on Agriculture. It would remove the exemption in the present law for pesticides registered under the federal pesticide law. This would bring pesticides under the law with registration fees ranging from $20 to $35 per product. In addition, labels would have to show, besides the usual requirements, the month and year of manufacture of the pesticide; and a statement of the name and percentage of each active ingredient together with the total percentage of the inert ingredients or such other statement of ingredients as may be approved by the State Plant Board.

California Assembly Bill 2537, amending the state's economic poisons law, would increase annual registration fees to $75 for the first economic poison with up to 10 for the same amount; all above the first 10 would

(*Turn to Page* 148)

for

STRENGTH

EASY HANDLING AND FILLING

SHARP, CLEAR BRAND PRINTING

CHASE Multiwall Bags

especially designed
for the packaging, shipping
and storage of Fertilizers

SINCE 1847

CHASE BAG COMPANY

GENERAL SALES OFFICES 309 W. JACKSON BOULEVARD
CHICAGO 6, ILLINOIS

30 BRANCHES AND SALES OFFICES STRATEGICALLY LOCATED

West Coast ACS Meeting Presents Papers on

Pesticides and Fertilizers

DISCUSSIONS covering a number of phases of both pesticides and fertilizers were heard at the meeting of the American Chemical Society, Los Angeles, Calif., March 15-19. Ralph B. March and Tetsuo R. Fukuto, University of California, Riverside, in a paper, "Metabolism of DDT in Susceptible and Insecticide-resistant House Flies," reported that application of DDT to resistant flies, either topically or by injection, resulted in the isolation of DDT, 2,2,-bis (*p*-chlorophenyl)-1,1-dichloroethylene and unchanged DDT. Materials used were radioactive(C^{14}) DDT, and 2,2-bis(*p*-chlorophenyl)-1,1,1-trichloroethane.

G. Q. Bateman, Clyde Biddulph, J. R. Harris, D. A. Greenwood and L. E. Harris, Utah Agricultural Experiment Station, Logan, Utah, were authors of another paper presented at the Los Angeles meeting. Titled "Toxaphene in Milk of Dairy Cows Fed Toxaphene-Treated Alfalfa Hay." The authors reported that alfalfa hay was sprayed with 0, 1, 2 and 4 pounds of toxaphene per acre. The degree of infestation with alfalfa weevil larvae before spraying and after was determined. The 2- and 4-pound levels gave good economic control.

Eight days after spraying, the alfalfa was cut and harvested. It was fed to 8 Holstein dairy cows, two receiving hay from each toxaphene treatment, and two untreated hay. The period of feeding was 112 days. Milk samples were taken at approximately weekly intervals throughout and analyzed for their toxaphene content.

The toxaphene residue on the hays was 0, 48, 114, and 415 p.p.m. from the 0-, 1-, 2-, and 4-pound treatments, respectively. None of the control cows had detectable amounts of toxaphene in their milk at any time, whereas all of the cows consuming treated hay did, the average amount varying from 2.3 to 18.2 p.p.m. All toxaphene had disappeared from the milk 34 days after the cows ceased consuming treated hay.

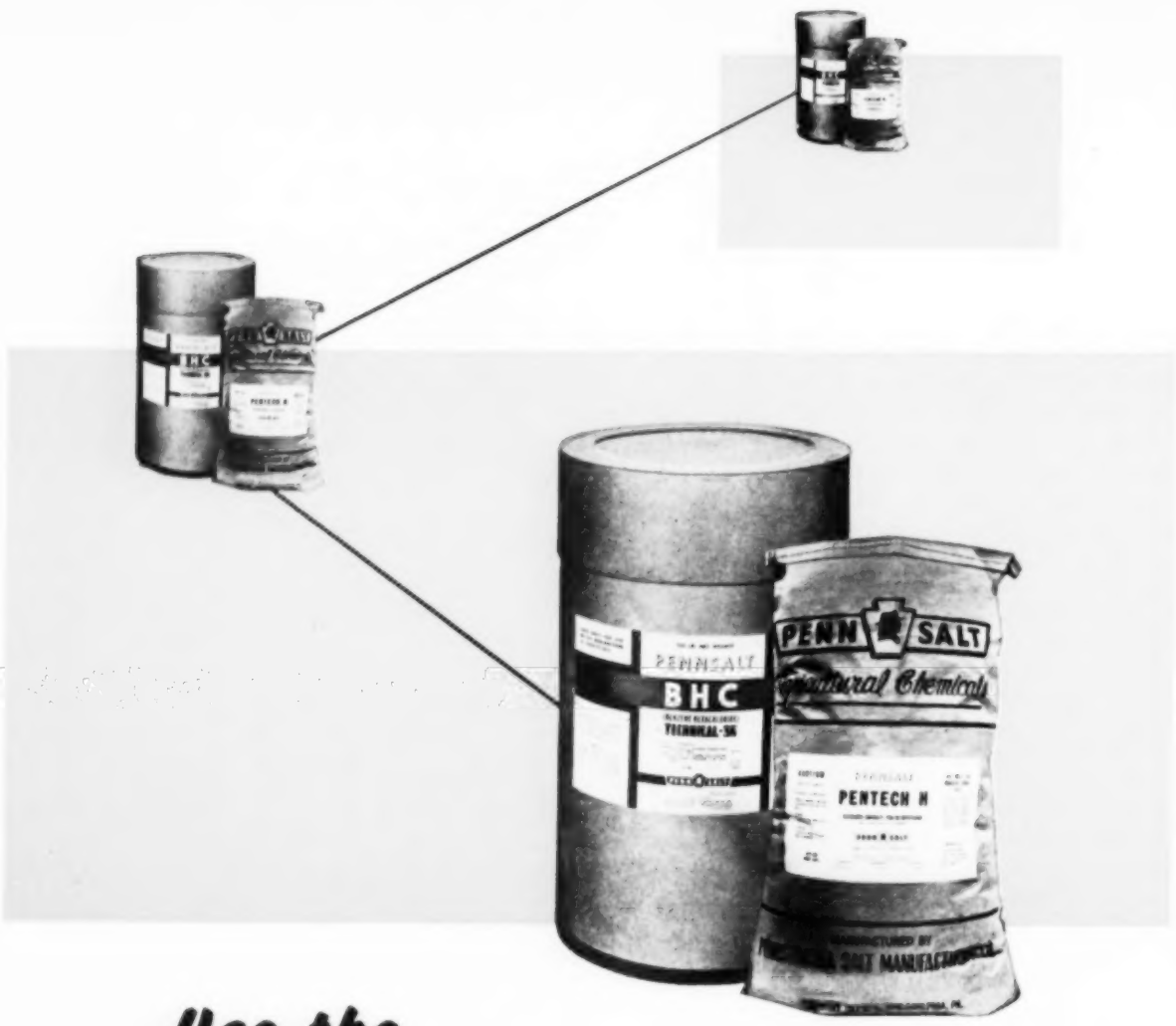
Milk and butterfat production was not influenced by the ingested toxaphene.

One control cow and one animal from the lots fed hay treated with 2 and 4 pounds per acre of toxaphene were slaughtered and selected tissues analyzed for toxaphene. Histological sections of liver and kidney were studied and the results are reported.

F. A. Gunther, G. E. Carman, M. J. Kolbezen, R. C. Blinn and R. L. Metcalf, University of California Citrus Experiment Station, Riverside, pointed out that against certain species of insects, 2,2,2-trichloro-1-(*p*-chlorophenyl)ethanol is a powerful insecticide when injected, yet is ineffective when applied by contact alone. In a paper, "Mechanisms of Insecticidal Action; Esters and Ethers of 2,2,2 - Trichloro-(*p* - Chlorophenyl) - Ethanol as Contact Insecticides," they reported that since lipoid solubility is acknowledged to be an important prerequisite to contact insecticidal activity, a number of hydrocarbon esters and ethers of this ethanol have been prepared and assayed as contact insecticides to evaluate this means of expediting such a transport mechanism. The hydrocarbon moieties contained from 2 to 16 carbon atoms in 2- to 4-carbon increments; the homologous units of maximum biological activity were further explored in 1-carbon increments, including space isomers, to permit the construction of activity-structure spectra for these series.

Both esters and ethers were prepared to permit evaluation of the role of in situ hydrolysis to the toxic moiety (presumably the parent ethanol) after the initial cuticle transport had been achieved.

The toxic effect of octamethylpyrophosphoramide (OMPA, "Schradan") appears to be associated with an inhibition of insect cholinesterase, therefore it is desirable to increase this activity, according to a paper, "Enhancement of the Anticholinesterase Activity of Octamethylpryophosphoramide by Chlorine" by E. Y. Spencer, Science Service Laboratory, Department of Agriculture, London, Ontario and R. D. O'Brien, Department of Chemistry, University of Western Ontario, London, Ontario, Canada. The authors pointed out that since OMPA is in vitro a weak anticholinesterase, it probably undergoes an activating conversion in plants, mammals, and some insects. In vitro activation of Schradan by oxidation with potassium permanganate has recently been reported from two sources. In one case [Casida et al., J. Am. Chem. Soc., 74, 5548 (1953)] formaldehyde was isolated as one of the end products of the decomposition of the activated Schradan, thus confirming a postulated mechanism of activation. Simultaneously we found formaldehyde on treatment of Schradan in an anhydrous solvent with chlorine. Up to 4 moles of formaldehyde per mole of Schradan have been found, depending on the degree of chlorination. An equivalent quantity of monomethylamine was isolated from the hydrolytic product with a corresponding de-



Use the one-two wallop of Pennsalt BHC-DDT

Here are two powerful, chlorinated insecticides which you can use in combination to control a wider range of insects . . . especially in cotton formulations and for cattle sprays and dips.

But whether you use them together or singly, you gain certain formulating advantages which are built into these modern, Pennsalt-developed products. Compare these Pennsalt features with those of other insecticides.

1. PENNSALT BHC TECHNICAL 36—up to three times as much of the gamma isomer . . . the *active* isomer against insects . . . proportionately less of the others. Less to handle, ship and store . . . better field strength formulations.

2. PENTECH®—technical DDT made by a patented process which reduces the wax-like nature of the technical material and makes it *friable*. Makes dust-preparation easier.

Other Formulating Aids Available

Pennsalt DB-50
(50%DDT dust base)

Pennsalt D-12
(12% gamma BHC dust base)

Pennsalt 9:15 Concentrate
(BHC-DDT Combination)

Always remember that you gain by dealing with a basic producer, and Pennsalt is a leading *basic* producer. This assures you of uniformly high quality, dependable source of supply, and economy. And Pennsalt has the technical know-how to help you spray-apply these insecticides at lower melting points during impregnation. Write us for technical assistance. Agricultural Chemicals Dept., Pennsylvania Salt Manufacturing Company, Philadelphia 7, Pa., Tacoma, Washington; Bryan, Texas; Montgomery, Alabama; Portland, Oregon; Los Angeles, Berkeley, Calif.

Pennsalt Chemicals

PROGRESSIVE CHEMISTRY FOR OVER A CENTURY

crease in dimethylamine. The anticholinesterase activity as measured with cholinesterase from human serum was increased about 2000 times from a pI_{50} of 1.7 for Schradan up to pI_{50} of 5.4 for some of the Schradan activated by chlorine oxidation. The stability of the chlorinated material was studied under various conditions, and it was shown by anticholinesterase assay to be relatively unstable at low pH.

As a further test of the postulated theory of the mechanism of activation of dialkyl phosphoramides, octaethylpyrophosphoramide was synthesized and chlorinated. Acetaldehyde was identified in the end product and the anticholinesterase activity of the chlorinated material was greatly increased over that of the original.

The subject of anticholinesterase activity in insecticides was pursued farther by M. J. Kolbezer and R. L. Metcalf, Riverside, Calif., in a paper, "Insecticidal and Anticholinesterase Activity of Substituted Phenylurethanes." The authors pointed out that eserine, prostigmine, and a number of other urethanes with very powerful anticholinesterase activity show almost no contact toxicity to the housefly. This apparently results from the inability of these compounds to penetrate membrane barriers such as insect cuticle and nerve sheath.

In order to determine whether the powerful enzyme-inhibitory action characteristic of many compounds containing the urethane group could be utilized in the development of contact insecticides, about thirty nonionic substituted phenylurethanes were synthesized. The inhibitory activity to fly brain cholinesterase and the contact toxicity to the housefly of these compounds were determined. The meta-substituted phenylurethanes were uniformly more active than the ortho and para isomers, and the most active member of the series, although possessing only one tenth the anticholinesterase activity of prostigmine, was highly toxic as a contact insecticide to the housefly.

Other papers reported on tests with various plant foods. In a session on March 19, with C. S. Boruff presiding, a paper, "Effect of Fertilizers on the Yield and Composition of Ranger Alfalfa Hay in Utah," emphasized that alfalfa is one of the most important forage crops in the United States; thus it is important to determine the best methods of producing maximum yields of hay with high nutritive value. The purpose of these studies was to determine the effect of different fertilizers on the yield and composition of Ranger alfalfa hay. Tests were conducted in six counties widely distributed over Utah. The fertilizer consisted of different levels of triple superphosphate ranging from 0 to 516 pounds per acre, barnyard manure, and trace elements consisting of copper, cobalt, boron, manganese, and zinc. Four replications were made at the time of planting in the springs of 1947 and 1948 with no additional treatments being made after that time.

The yields of alfalfa hay obtained varied from location to location and from year to year. Significant increases, due to the phosphate treatments in the yield of alfalfa hay, were noted from three of the six locations studied for five consecutive years and one location showed significant increases for two years only. These increases in yield varied from 5 to nearly 300%. The addition of triple superphosphate plus the trace elements copper, cobalt, and manganese resulted in significant increases of these elements in alfalfa produced during the first two years after the fertilizers were applied. Analyses of the alfalfa hay grown during the last three years of the test were said to be under way and will be reported at a later date.

•

New Calspray Plant in Ark.

Construction of the $100,000 insecticide plant of the California Spray-Chemical Company of Shreveport, La. is scheduled for completion at Pine Bluff, Ark., by July 1. Agricultural and livestock insecticides for Arkansas retailers handling the firm's products will be produced at the new plant. The plant will have a daily capacity of 50 tons of dust at peak operation.

USDA Predicts Fewer Bugs

Numerous local infestations of grasshoppers, chinch bug and crickets are predicted by the U. S. Department of Agriculture, but few serious widespread infestations are expected, the Bureau of Entomology and Plant Quarantine says.

In a bulletin issued March 21, the U.S.D.A. says that cropland grasshoppers are not likely to become serious pests over great regions of the United States but warns that several local areas may be faced with serious infestations before the end of summer. Basing their opinions on field surveys, the insect control specialists say that if weather conditions permit hoppers to develop normally, they threaten to build up destructive populations in central South Dakota, northeastern Wisconsin, in the panhandle of Texas, and in central Utah. Dry weather in southern Illinois, Indiana, and in Ohio could result in grasshopper problems in these states. Certain cropland areas in Idaho, Washington, and California may be damaged by grasshoppers breeding in nearby native range lands.

Northeastern New Mexico and adjacent areas of bordering states have been marked as containing the largest infestations of rangeland grasshoppers. Montana, Idaho, Washington, Oregon, Nevada, and Utah may expect severe range infestations, but involving much less land than the New Mexico infestation.

Despite extensive and successful control efforts against Mormon crickets in 1952, great numbers of these pests are anticipated this year in the northern half of Nevada and Tooele county, Utah. Small but heavy infestations may be looked for in Idaho, Oregon, California, Montana, Colorado, and Wyoming.

More chinch bugs went into hibernation last fall than for several years in Oklahoma, Arkansas, Missouri, and Illinois. A warm, dry spring and early summer in these states could bring trouble from this corn and grain feeding pest. Little or no trouble is expected from chinch bugs in other central states except in Indiana where local infestations may do some damage.

Calmonite

AMMONIUM NITRATE-LIME

20.5% NITROGEN

2 FERTILIZERS IN 1
Contains 10.25% quick-acting *nitrate* nitrogen.
Contains 10.25% longer-lasting *ammonia* nitrogen.

GREEN PELLETS READY TO USE
Sized for flow and ease of application in broadcasting, top dressing, side dressing, and irrigation. Non acid-forming.

ECONOMICAL SOURCE OF N
At low cost, Calmonite furnishes Nitrogen in the 2 forms needed by all plants — for rapid, early vigorous growth and sustained development.

SUPPLIES CALCIUM, TOO
Contains 35% to 40% calcium carbonate, secondary plant-food essential to soil productivity and good crop yields.

NOW AVAILABLE, F.O.B.
Regular Atlantic and Gulf ports, in even-weight, 6-ply paper bags with 2 bituminous liners.

LOOK AT CALMONITE!
Write for a sample and for additional information today.

EXCLUSIVE DISTRIBUTORS FOR
RUHR-STICKSTOFF AKTIENGESELLSCHAFT,
BOCHUM, GERMANY

H. J. BAKER & BRO.
600 Fifth Avenue, New York 20, N. Y.
Branch Offices
Baltimore, Chicago, Savannah & Tampa

H. J. BAKER & BRO.

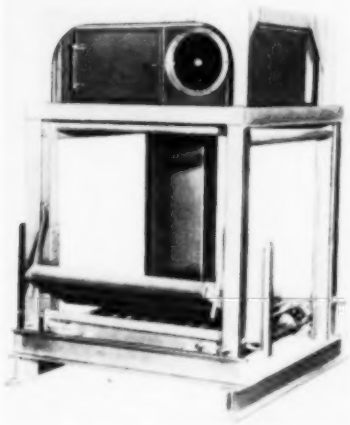
Suppliers' BULLETINS

Emulsol Bulletin Ready

Emulsol Corporation has issued its technical bulletin No. 36 describing emulsifier "Emcol H-82." The product is recommended by its makers for specific toxaphene and chlordane emulsifiable concentrates at low use levels for broader range of natural waters to give tighter, more spontaneous and more stable emulsions. The bulletin is available from Emusol Corporation, 59 E. Madison St., Chicago 3, Ill.

•

Scale Rejects Off-Weights



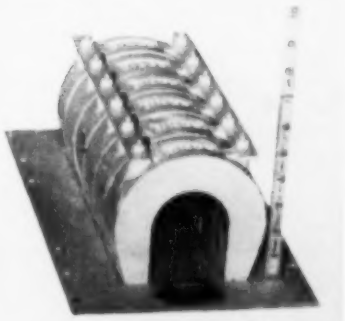
A new weighing device which indicates the weight of filled containers and then separates any off-weight containers from the properly-filled ones, has been introduced to the fertilizer and pesticide trade by the Thayer Scale and Engineering Corp., Rockland, Mass.

The machine, Model 200S Checkweight Scale, consists essentially of an enclosed electro-mechanical weighing mechanism and a motor-driven conveyor belt. A dial indicator on the scale shows the amount each package is overweight or underweight and additional indicators may be installed at remote control stations, the makers say. For added control, a horn within the scale sounds as each off-weight package is discharged. Colored signal lights may also be furnished for indicating the weight classification of each unit.

A similar scale, designated as Model 200, has the same performance specifications as the 200S and has the conveyor mounted at the top of the scale platform. Complete details of the weighing devices are available from Mr. Floyd L. Thayer, sales manager, Thayer Scale and Engineering Corporation, East Water Street, Rockland, Mass.

•

Offers Magnetic Separator



Dings Magnetic Separator Co., Milwaukee, Wisc., has issued a new bulletin on its re-designed line of permanent plate magnets for removing tramp iron from material carried in chutes, ducts or on belts. The com-

(*Turn to Page* 119)

Announces "Swingfog" Applicator

DEVENCO, Inc., New York, is introducing in the United States, a new type insecticide applicator, "Swingfog". Weighing but 30 pounds, the device can be carried by an operator into places where insects pests are located in agricultural or industrial areas.

The makers state that basically, the apparatus consists of a pulse-jet heater, fuel tank, hand air pump, rifle-like exhaust tube.

The fog output is about 35,000 cubic feet in five minutes, according to the manufacturers.

To start the "Swingfog" into operation, a battery is used briefly, but is disconnected within a matter of seconds and the machine then operates on its own power. (See photo below)

Full descriptive literature is available from Devenco, Inc., 150 Broadway, New York 38, N. Y.

The name BAGPAK is a standard of leadership, and of quality...for BAGPAK means *complete* production control in bag manufacture, from the planting of seedlings which eventually produce pulp, to the delivery of the finished sack to your plant —in fact, even to the furnishing of special filling and closing machines to insure the best protection for your product.

Multiwall Paper Shipping Bags are described in the above brochure. For your copy, write to Bagpak Division, International Paper Company, 220 East 42nd St., New York 17, Dept. D-7

International Paper COMPANY

BAGPAK DIVISION

Technical BRIEFS

Shelled Corn Fumigants

An 80-20 mixture of carbon tetrachloride and carbon disulfide at a dosage of 5 gallons per 1,000 bushels has been the standard treatment for shelled corn in steel bins for several years. Unsatisfactory kills in out-of-condition corn, scarcity of materials, and the need for information regarding dosages in other types of storage structures led to further study of this mixtue and other fumigants.

In metal bins the standard dosage of the 80-20 mixture was satisfactory if caked and moldy surface grain was removed before treatment unless infestations of the Angoumois grain moth were present. In wooden bins it was necessary to increase the dosage to 7 gallons per 1,000 bushels. In all bins infested with the Angoumois grain moth, it was difficult to kill this insect in the surface grain. Surface applications of fumigants proved to be impractical, but spraying with an odorless oil at the rate of 2 quarts per 100 square feet of surface grain gave a satisfactory control.

The addition of 10 percent (by volume) of methyl bromide to the 80-20 mixture of carbon tetrachloride and carbon disulfide, or to a 75-25 mixture of ethylene dichloride or propylene dichloride and carbon tetrachloride increased the toxicity to a point where satisfactory kills could be obtained with 2 gallons per 1,000 bushels in metal bins. Three gallons per 1,000 bushels of the 80-20 mixture plus methyl bromide in wooden bins and 2½ to 3 gallons per 1,000 bushels in quonsets gave satisfactory results.

A spray boom mounted on a wooden sled was used to apply the methyl bromide mixture to shelled corn in quonsets from outside the building.

Other fumigants found to be highly effective for the treatment of shelled corn in metal bins were a 17-83 mixture of 1,1-dichloro-1-nitroethane and carbon tetrachloride at 2 gallons and a 10-90 mixture of bromotrichloromethane and carbon tetrachloride at 3 gallons per 1,000 bushels. The latter mixture did not kill all immature stages of the rice weevil.

Various mixtures of methyl bromide with ethylene dibromide and chloropicrin were unsatisfactory under the conditions of these tests.

—Summary of U.S.D.A. Bulletin E-855, "Evaluation of Fumigants for Shelled Corn," by L. M. Redlinger, B. R. Wilson, R. T. Cotton and H. H. Walkden, Division of Stored Product Insect Investigations.

•

Effect of 2,4-D in Soils

Applied at usual rates for weed control, 2,4-D has been found to be non-injurious to soil bacteria in experiments at the Pennsylvania Agricultural Experiment Station, State College, Pa. A report by J. J. Reid, Penn State College, appearing in the March bulletin, tells of trials with 2,4-D to determine its effect on soils when applied at concentrations of 250 and 500 ppm. (as compared to the usual 2 pounds per acre application which is at the rate of four parts per million.)

The material disappeared in soil media in from one to six weeks, depending upon whether the organic matter content of the soil was high, whether the soil had been used previously in the trials and was adapted to 2,4-D, and whether the herbicide was applied as the amine or the salt. When applied at the highest rate, the nitrifying capacity of the soils was only slightly depressed, and was not depressed at all by the lower concentration.

Mr. Reid reports that two interesting developments became apparent as the 2,4-D disappeared. Although nitrification tended to continue at usual rates and the 2,4-D content of the soil was unchanged for a period, the herbicide all but vanished in a few days when the bacteria became adapted to it.

Soil once adapted to 2,4-D did not have to go through the full preliminary period again to dispose of 2,4-D. Apparently, the bacteria were able to quickly renew their power to disintegrate 2,4-D and disposed of it much sooner than in unadapted soils.

The first soil tested contained 22 per cent organic matter, a higher content than many farm soils. 2,4-D was found to disappear rather rapidly from this sample. To approach usual conditions, soil was obtained from plot 16 of the Jordan Fertility Plots. This plot receives manure at the rate of 6 tons per acre every other year and is limed as needed. In comparative trials, the 500 parts per million dosage of 2,4-D actually disappeared from the high organic matter soil in one test sooner than the 250 parts per million dose. After the soils became adapted to dosages of 2,4-D, the chemical disappeared in about one-fourth of the time required for the first application.

•

Aldrin OK on Wireworms

Aldrin has been granted official label acceptance by the U. S. Department of Agriculture for control of wireworms on sweet potatoes throughout the United States. This announcement follows closely the earlier announcement of the acceptance of aldrin for control of wireworms on Irish potatoes.

Tests made during the past four years covering all major growing areas in the United States have established aldrin for the control of wireworms, among the more destructive pests for all kinds of potatoes. They have been among the most dif-

(*Turn to Page* 119)

New DuPont CMU New Profits For

NOW! Offer CMU Weed Control As A New Service to Industrial Plants

Here's a powerful new weed killer that offers many advantages in controlling unwanted vegetation . . . and new opportunities for service and profit to people who have the know-how and the equipment to apply it.

Many Places to Use It

Just take a look at the plants you service, or pass in your travels. Note all the spots where weeds and grass are a fire hazard, an eyesore, a haven for vermin or just a plain nuisance: around storage areas, stockpiles, pole yards, rail sidings, foundations, storage tanks, parking lots, signposts, along fences.

Easy to Apply

As little as one application of 1 or 2 pounds of CMU weed killer per 1,000 square feet (40 to 80 pounds per acre) usually keeps the ground bare for an *entire* growing season or longer. All you do is mix it with water and apply it in your regular spray equipment. CMU is non-flammable, non-volatile and non-corrosive to equipment. Storage and handling are a minor problem indeed.

You Are the Key Man

Cash in this spring on this new field, this tremendous new market for your services. Most of the people who need CMU also need you to apply it for them. You have the know-how and the equipment.

Du Pont Sales Helps

CMU is nationally advertised to all types of industry. To help you sell your service and make yourself known in this field, Du Pont has a sales-promotion kit to which you are welcome. Why not ask for it now? Use the coupon or write on your own letterhead.

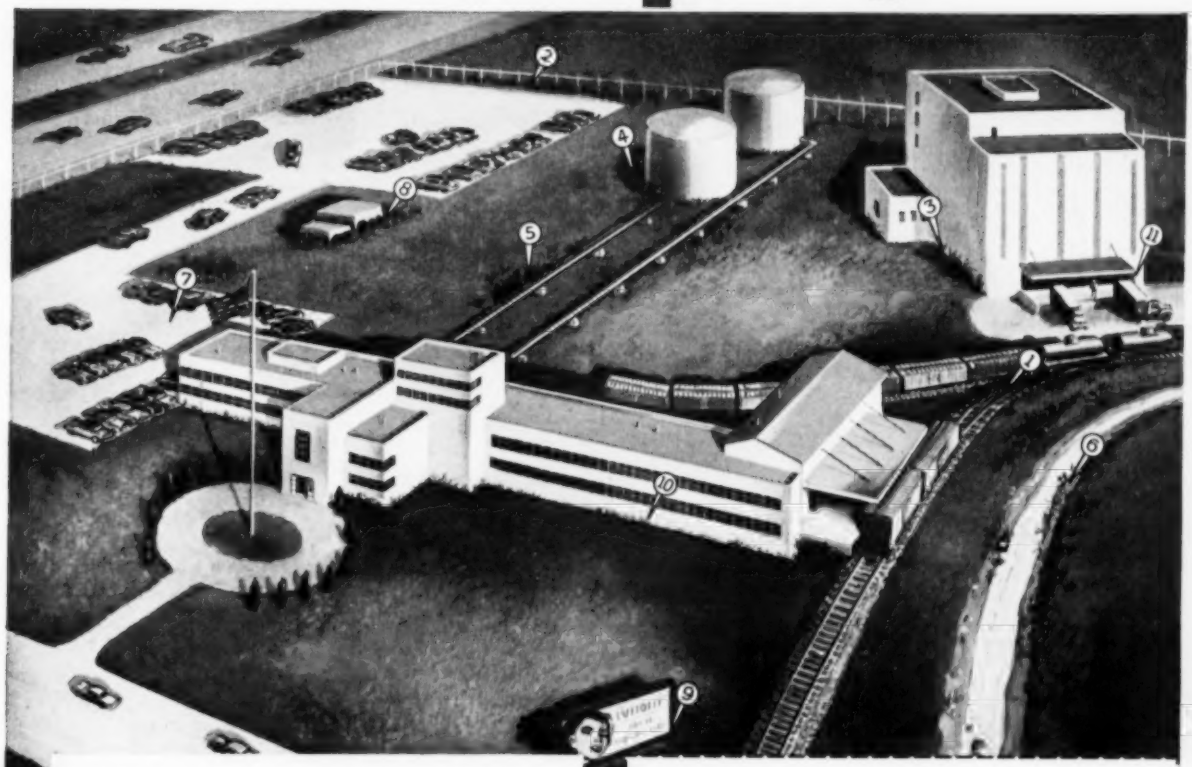
DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

Write for full

on

Weed Killer Offers Custom Sprayers



ELEVEN AREAS around this typical industrial plant need CMU weed control to cut fire hazards and costly maintenance. Around—**(1)** rail siding, **(2)** fence rows, **(3)** warehouses, **(4)** storage tanks, **(5)** pipe lines, **(6)** drainage ditch, **(7)** parking field, **(8)** storage areas, **(9)** billboards, **(10)** foundations, **(11)** truck loading area.

information
DuPont CMU

Q-4

CHECK HERE!

E. I. du Pont de Nemours & Co. (Inc.)
Grasselli Chemicals Dept.
Wilmington, Delaware

( ) Please send me full information on CMU, including your sales promotion kit for custom sprayers.

( ) Please have a Du Pont technical service man call.

Name_____

Firm_____

Street_____

City_____ State_____

Hudson foresters choose a stand of prime timber for multiwall Kraft from Hudson's 435,000 acres. They practice selective harvesting, always leaving parent trees to help with the new crop, by natural reseeding.

Careful selection of trees for mechanized cutting gives uniform quality and dependable supplies of raw materials for pulp making.

Every year about 1½ million southern pine seedlings are planted on Hudson tree farms.

Here is why HUDSON can guarantee Multiwall Sacks against breaking on the packer

REASON NUMBER 1 HUDSON GROWS ITS OWN TREES

Tree farming is big business with Hudson. Every month the company's Palatka, Florida, mill converts 620 freight carloads, 2,515 truck loads, and 10 barge loads of company-grown pine into long-fiber Kraft.

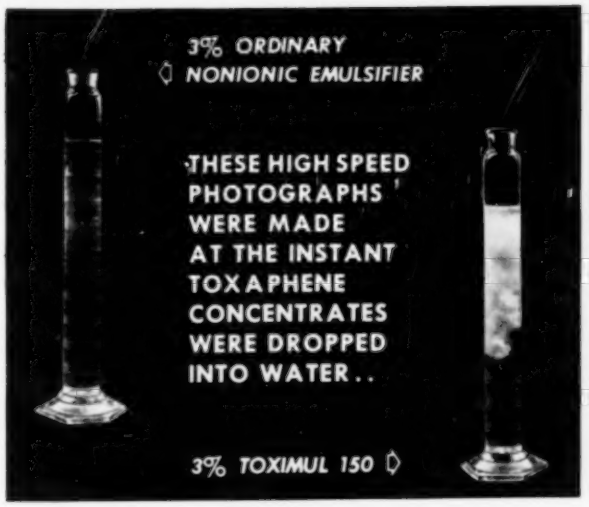
By growing its own trees, Hudson can exert iron-clad control of Multiwall Sack quality and delivery schedules. This is one reason why Hudson can guarantee to replace *without cost* all Hudson Multiwall Sacks that fail on your packing or closing machines.

HUDSON MULTIWALL SACKS

Send for these 3 helpful folders:

"Avoid Breakage," "Dependable Source of Supply," and latest issue of "Sack Sense." Also full details on Hudson's unusual Replacement Guarantee. No obligation.

HUDSON PULP & PAPER CORP.,
Dept. 144 505 Park Ave., New York 22, N.Y.


3% ORDINARY
NONIONIC EMULSIFIER
THESE HIGH SPEED PHOTOGRAPHS WERE MADE AT THE INSTANT TOXAPHENE CONCENTRATES WERE DROPPED INTO WATER..
3% TOXIMUL 150

A NEW EMULSIFIER

Specifically for Toxaphene..

TOXIMUL 150

As a result of the growing trend toward low gallonage liquid sprays in cotton crop protection, more efficient emulsifiers are required than hitherto available.

TOXIMUL 150 has been developed specifically to fill this need for an outstandingly effective emulsifier for Toxaphene and Toxaphene DDT systems, giving spray concentrates with the following important properties:

- *Flash emulsification, with only 3% emulsifier*
- *Equal effectiveness in hard or soft water*
- *Slow creaming rates, and no oiling*
- *High storage stability*
- *Low Cost*

SEND TODAY FOR SAMPLE AND BULLETIN

Also

TOXIMUL 250

An exceptionally effective emulsifier for Chloro-IPC. Flash dispersion in soft and hard water.

NINOL

Detergents — Emulsifiers

NINOL LABORATORIES

1719 S. CLINTON • CHICAGO 16 • PHONE CHESAPEAKE 3-9625

In Canada: Chemical Developments of Canada Ltd., 420 Lagauchetiere Street W., Montreal 1, Quebec

DDT

TECHNICAL DDT

DDT DUST CONCENTRATE

75% DDT WETTABLE POWDER

when you want it promptly

Check with Michigan Chemical for your continuous, fast supply of DDT. You can be sure of exceptionally high purity, uniform production, and prompt service.

Strategically located in the midwest agricultural area, Michigan Chemical is a basic producer of DDT for Agricultural use. This, together with favorable transportation facilities, assures you a most satisfactory source. Just as a trial, place your next order with Michigan Chemical. You'll get results that surpass promises.

MC

MICHIGAN CHEMICAL CORPORATION • St. Louis, Michigan

SALES OFFICE: 230 Park Avenue
New York 17, New York

BASIC MANUFACTURERS OF INDUSTRIAL, PHARMACEUTICAL, AND AGRICULTURAL CHEMICALS

A BRAND NEW

ANTARA CHEMICALS CATALOGUE

a Complete 28-page Guide to Antara's Broad Line of Chemical Products

Here's a reference book that you'll want in your catalogue library. It introduces a simplified nomenclature system for Antara Chemical specialties and includes important application suggestions in a wide range of industries.

Fill in the coupon below and mail today for your free copy.

ANTARA CHEMICALS

Division of General Dyestuff Corporation

435 HUDSON STREET, NEW YORK 14, N. Y.

Please send me copy of "Antara Chemicals Catalogue"

AC

NAME_____

TITLE_____

FIRM_____

ADDRESS_____

What's Your Problem?

There's a Colorado .44 product for every agricultural need!

COFFEE BORER

The Brazilian government recommends the use of BHC for Coffee Borers. For the finest, most effective and most economical BHC formulations, find out about Colorado .44 BHC for Coffee Borers. Write today for full information.

WHEAT INSECTS

Are wheat insects causing crop losses? Then Colorado .44 Chlordane, with its "triple killing action" is for you. Chlordane assures high death rate for pests in the shortest possible time, because it kills three ways: 1) by vapor, 2) stomach poison, 3) contact. Colorado .44 Chlordane is highly recommended for use in municipal sanitation, because of its deadliness against cockroaches, disease carrying flies, mosquitoes, and mange on hogs. Also effective against ants, crickets, centipedes, scorpions, silverfish and black widow spiders.

BOLL WEEVILS

When crop insurance against the Boll Weevil is needed, use Colorado .44 Toxaphene. Toxaphene is recommended by the U. S. Department of Agriculture for use against the grasshopper too. Get Colorado .44 Toxaphene now, for use against boll worms, cotton aphid, cotton leafworm, as well as the Boll Weevil and Grasshopper.

WEEDS

Colorado .44's 2-4D Esters and Amines, and 2,4,5-T are recommended for elimination of brush and weeds, which rob crops of moisture, vital minerals, plant foods and sunlight. Selective weed killers give effective control at minimum cost and labor. Eliminates cocklebur, dandelion, mustard, plantain, ragweed, pigweed, saw thistle, bindweed and other troublesome weeds in small grains, flaxes, lawns, pastures, corn and grass seed crops.

LIVESTOCK PESTS

Are livestock losses from ticks, lice and flies causing extra work and weight losses? If so, then the solution to your problem is Colorado .44 Gold Star Livestock and Barn Concentrate. Adds pounds to your cattle and other livestock by eliminating the annoyance of weight reducing pests. Colorado .44 Gold Star is also recommended as residual control in and around barns.

CORN BORER

Colorado .44 DDT is effective in the fight against the Corn Borer. Get easy-to-use Colorado .44 DDT! DDT is recommended to control the Corn Borer and is probably the only effective insecticide against this pest. Write for technical information on Colorado .44 DDT for Corn Borers and other uses.

CHEMICAL CORPORATION OF COLORADO

P.O. BOX 777, DENVER 1, COLORADO

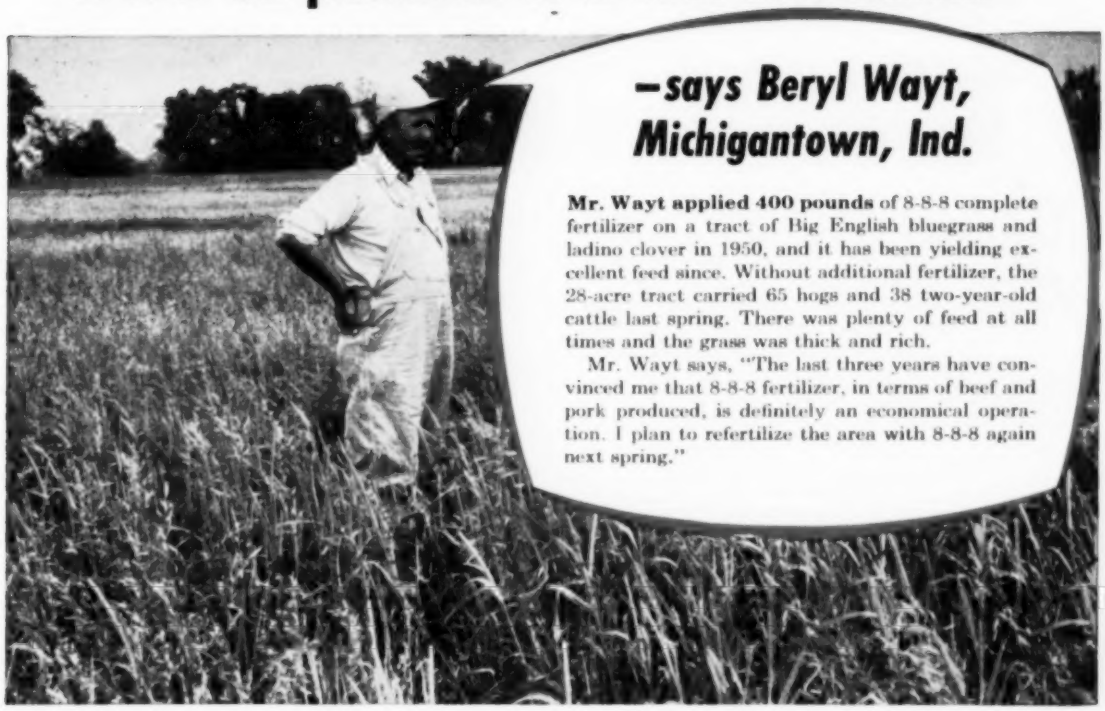
For Lowest Export Prices Phone, Write or Wire:

EXPORT CHEMICAL CORPORATION OF COLORADO

P. O. BOX 777 • DENVER 1, COLORADO • CABLE ADDRESS—EXCHEM

Distributorships Available In Several Countries.

"In terms of beef and pork produced, 8-8-8 on pastures is a real investment"



—says Beryl Wayt, Michigantown, Ind.

Mr. Wayt applied 400 pounds of 8-8-8 complete fertilizer on a tract of Big English bluegrass and ladino clover in 1950, and it has been yielding excellent feed since. Without additional fertilizer, the 28-acre tract carried 65 hogs and 38 two-year-old cattle last spring. There was plenty of feed at all times and the grass was thick and rich.

Mr. Wayt says, "The last three years have convinced me that 8-8-8 fertilizer, in terms of beef and pork produced, is definitely an economical operation. I plan to refertilize the area with 8-8-8 again next spring."

Bigger yields for farmers mean better business for you

THE big yields that high-nitrogen fertilizers produce are the strongest argument in favor of their use. Farmers find they pay for themselves over and over again.

Results like this are pushing the demand for high-nitrogen complete fertilizers up and up. Meet this demand by giving high-nitrogen fertilizers a big spot in your sales program.

And for the best results, use U·S·S Ammonium Sulphate for a major part of the nitrogen content. It's a dry, free-running material that performs well in mixing as well as in distributing equipment.

For complete information on U·S·S Ammonium Sulphate, get in touch with our nearest Coal Chemical sales office or write directly to United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

U·S·S AMMONIUM SULPHATE

3-447

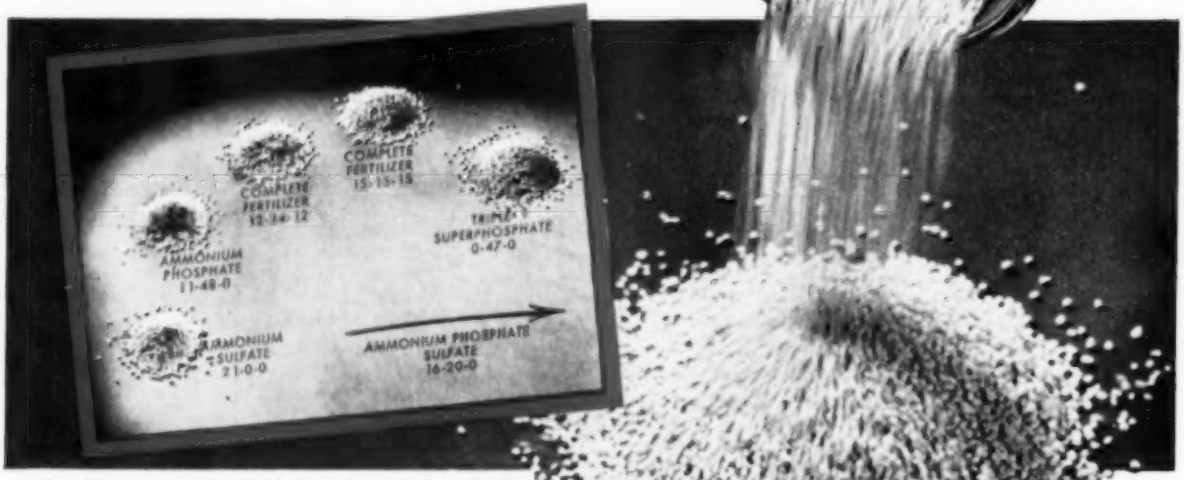
UNITED STATES STEEL

FREE-FLOWING GRANULES

IMPORTANT CHARACTERISTIC OF CONCENTRATED FERTILIZERS PRODUCED BY DORR-DESIGNED PLANTS

These chemical fertilizers will never compact in a storage bin nor clog a farmer's spreader. Their uniform, round granules will remain free-flowing and dustless until used . . . thanks to the exclusive Dorrco Fines Recirculation System employed in their production.

This is the only System which can interchangeably produce triple superphosphate, ammonium phosphates and sulfate or complete concentrated products in a 100% granular form of exceptional uniformity. It is but one of the many innovations introduced in the field of phosphatic fertilizer production by Dorr during the past 35 years.



It will pay you to check Dorr's complete facilities ranging from laboratory testing through plant design and construction. Write for Bulletin #8000, or better still, let us send an engineer to discuss your problems from the standpoint of economics and process. No obligation, of course.

Better tools TODAY to meet tomorrow's demand

DORR

WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

THE DORR COMPANY • ENGINEERS • STAMFORD, CONN.

Offices, Associated Companies or Representatives in principal cities of the world

RHOTHANE D-3...

Rohm & Haas name for

DDD TDE

RHOTHANE is the pioneer and the standard among DDD or TDE insecticides. The recent installation of new facilities means greater availability—material to meet your demands —products of the highest quality. Available as technical flakes, solution, emulsifiable concentrate, wettable powder and dust concentrate.

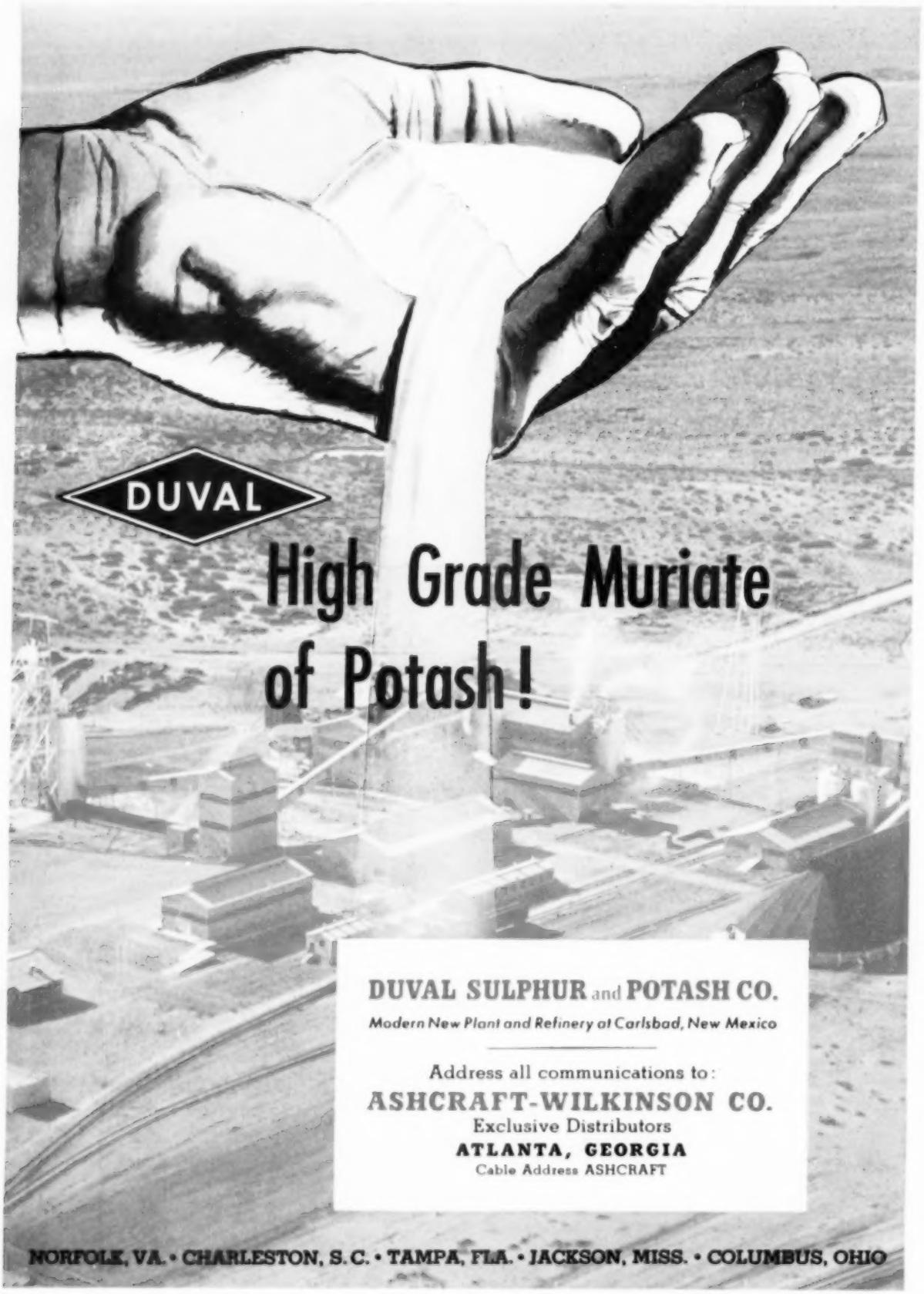
CHEMICALS FOR AGRICULTURE

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

RHOTHANE *is a trademark, Reg. U.S. Pat. Off. and in principal foreign countries.*


DUVAL
High Grade Muriate of Potash!
DUVAL SULPHUR and POTASH CO.
Modern New Plant and Refinery at Carlsbad, New Mexico
Address all communications to:
ASHCRAFT-WILKINSON CO.
Exclusive Distributors
ATLANTA, GEORGIA
Cable Address ASHCRAFT
NORFOLK, VA. • CHARLESTON, S.C. • TAMPA, FLA. • JACKSON, MISS. • COLUMBUS, OHIO

The Perfect

INSECTICIDE EXTENDER

- for -

Air Dusting

and

Machine Dusting

FOR HIGHEST QUALITY

at lowest cost always specify uniform Palmetto Clay. Natural deposit purity combine with modern production and quality control to bring you the finest low cost extender.

COMPARE!

Compare quality controlled Palmetto Clay with your present diluent. Send for a working sample today.

Finer:

80-85% of Palmetto particles are less than 2 microns in size. Allows most effective active ingredient dispersion. Palmetto Clay is free flowing, non-hygroscopic, low in grit content and has good adhesion and colloidal properties.

Less Abrasive:

Less than 0.50% retained on a 325 mesh screen. Virtually eliminates abrasion.

Lasting Suspension:

Make this test, mix 25 grams of Palmetto diluent in 225 c.c. of distilled water by stirring 7 minutes in high speed mixer. Then immediately fill a 100 c.c. Nessler tube and note height of solids column after 24 hours.

INTERNATIONAL CLAY CORPORATION

P. O. BOX 371 GRANITEVILLE, S. C.

IT PAYS YOU TO DO BUSINESS WITH

COLUMBIA-SOUTHERN

Agricultural chemical processors and manufacturers of dust concentrates can always depend on the products and the integrity of Columbia-Southern.

Columbia-Southern considers its promises to customers to be sacred obligations.

But we ask you to look even further. These four important factors lie behind the Columbia-Southern brand:

1. Basic producer of alkalies, chlorine and certain chlorinated compounds.
2. Finest production facilities.
3. Adequate stocks at strategic locations.
4. Progressive research.

Choose Columbia-Southern and rest assured.

BHC

Benzene Hexachloride
(for manufacturing use only)

CHLORO-IPC*

*Brand name of Columbia-Southern for Isopropyl N (3-Chlorophenyl) Carbamate

HI-SIL

Hydrated silica of extremely fine particle size

COLUMBIA-SOUTHERN CHEMICAL CORPORATION

SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY

420 DUQUESNE WAY, PITTSBURGH 22, PENNSYLVANIA

PLANTS: BARBERTON, OHIO • BARTLETT, CALIFORNIA • CORPUS CHRISTI, TEXAS • LAKE CHARLES, LOUISIANA • NATRIUM, WEST VIRGINIA
DISTRICT OFFICES: BOSTON • CHARLOTTE • CHICAGO • CINCINNATI CLEVELAND • DALLAS • HOUSTON • MINNEAPOLIS • NEW ORLEANS NEW YORK • PHILADELPHIA • PITTSBURGH • ST. LOUIS • SAN FRANCISCO

heptachlor

CONTROLS ALFALFA WEEVILS

Wherever alfalfa weevils are an economic problem, farmers will use Heptachlor to control them.

Alfalfa-growing states recommend Heptachlor for weevil control. Heptachlor is effective.

Applied in early Spring it kills the adults before they lay their eggs.

Heptachlor is easy to apply with standard spraying or dusting equipment. Heptachlor is economical.

It provides complete protection against alfalfa weevils at the very low dosage of 4 ounces per acre.

Heptachlor is very effective also against many other agricultural insect pests. Count on Heptachlor in your insecticide formulations to give low cost insect control, to help produce greater profits.

WRITE FOR COMPLETE DETAILS

PETROLEUM DERIVED CHEMICALS
VELSICOL
SERVING BASIC INDUSTRIES

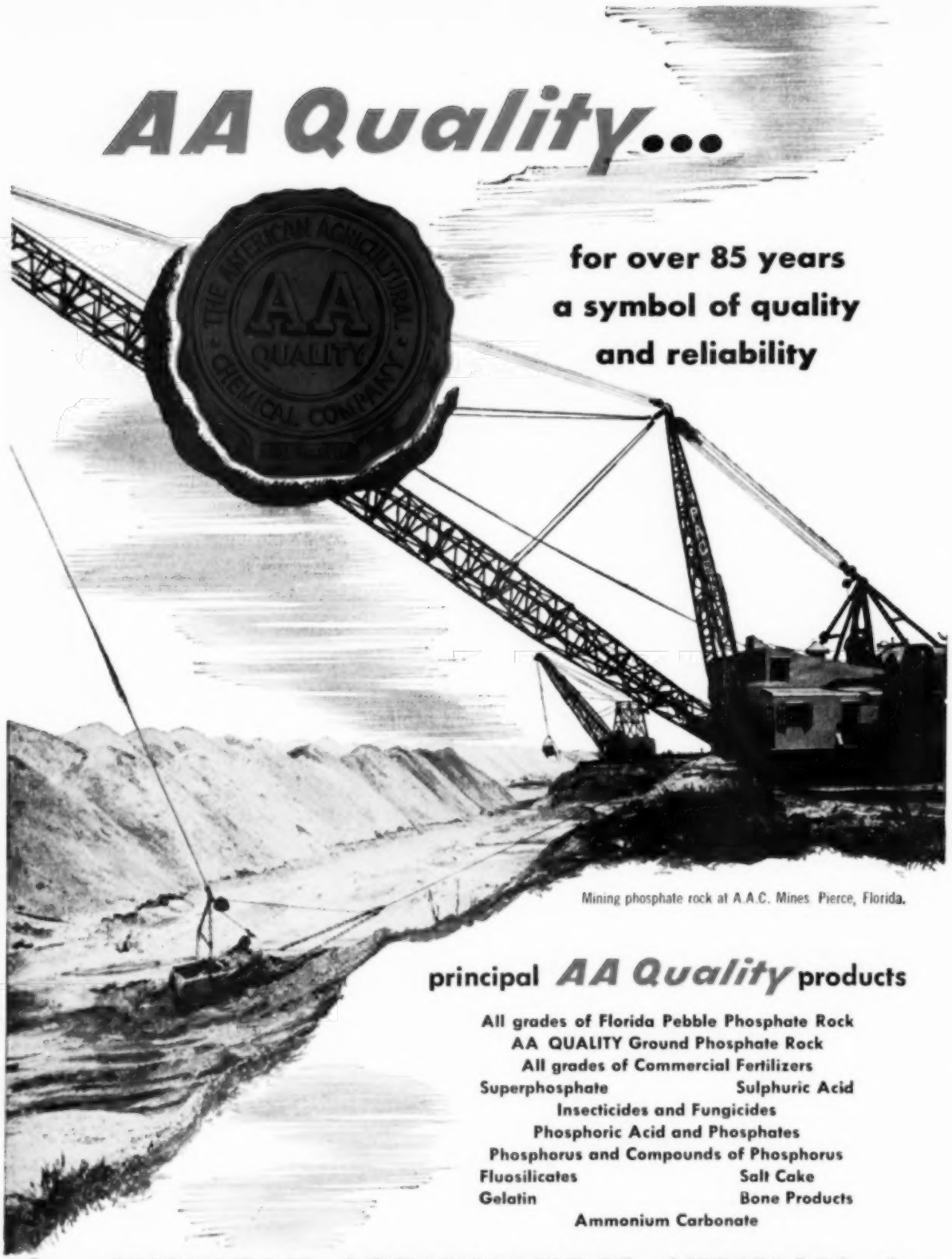
VELSICOL CORPORATION
Division of Amoy Corporation

General Offices and Laboratories
330 East Grand Avenue, Chicago 11, Illinois

Export Division
100 East 42nd Street, New York 17, New York

REPRESENTATIVES IN PRINCIPAL CITIES

AA Quality...



for over 85 years
a symbol of quality
and reliability

Mining phosphate rock at A.A.C. Mines Pierce, Florida.

principal *AA Quality* products

All grades of Florida Pebble Phosphate Rock
AA QUALITY Ground Phosphate Rock
All grades of Commercial Fertilizers
Superphosphate — Sulphuric Acid
Insecticides and Fungicides
Phosphoric Acid and Phosphates
Phosphorus and Compounds of Phosphorus
Fluosilicates — Salt Cake
Gelatin — Bone Products
Ammonium Carbonate

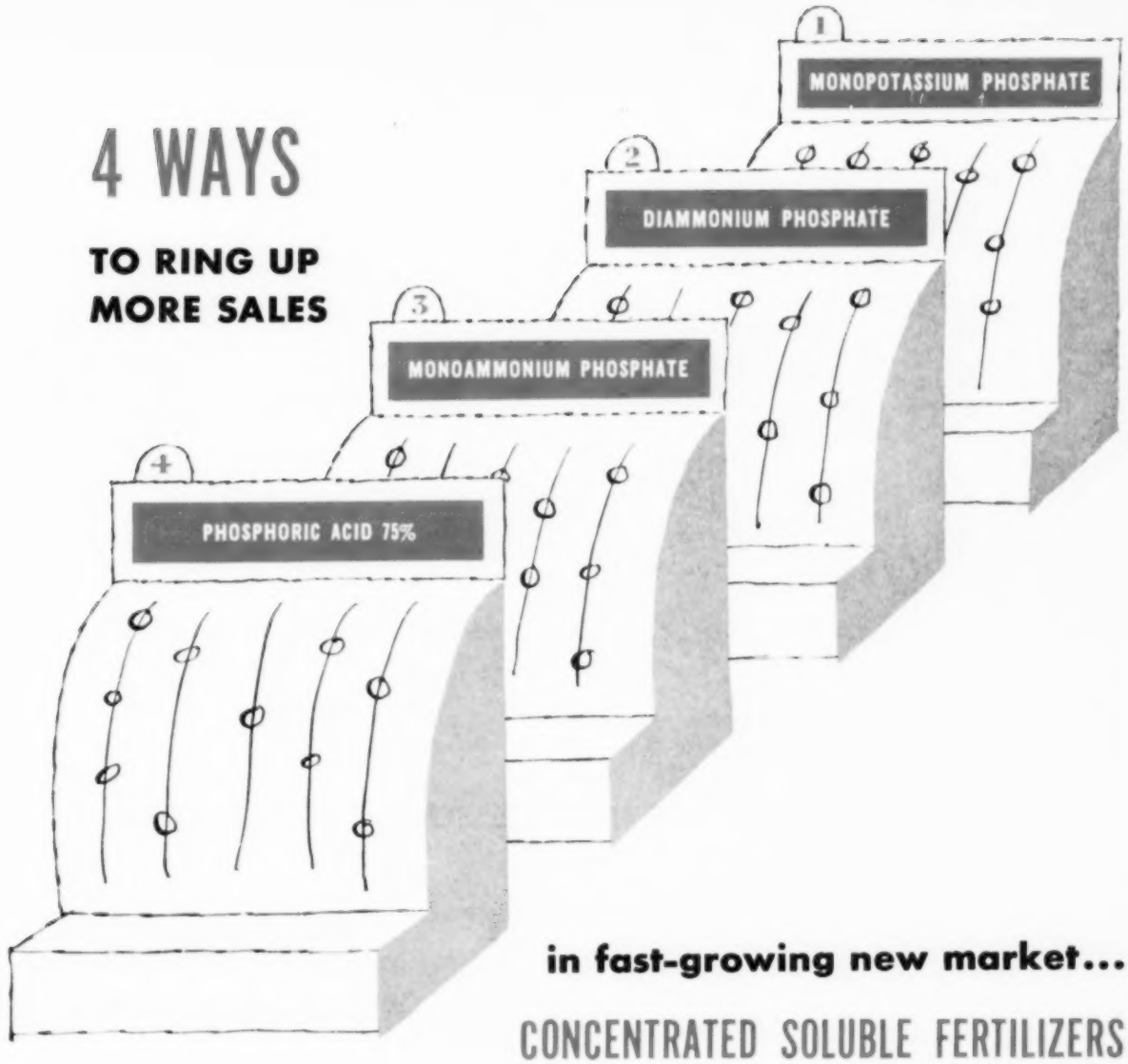
The AMERICAN AGRICULTURAL CHEMICAL Co.

GENERAL OFFICE: 50 CHURCH STREET, NEW YORK 7, N.Y.

30 FACTORIES AND SALES OFFICES, SERVING U.S., CANADA AND CUBA—ASSURE DEPENDABLE SERVICE

4 WAYS

TO RING UP MORE SALES



in fast-growing new market...

CONCENTRATED SOLUBLE FERTILIZERS

Current market reports clearly show the heavy swing to soluble fertilizers by a wide variety of agricultural and home gardeners.

Alert formulators are moving into this profitable, fast-growing market *now*. Monsanto helps them—as it can help you—by furnishing concentrated nutrients that are pure, soluble and easily compounded.

You'll find these high-quality materials will mean plenty of repeat business for you because they give your customers these important advantages:

Easy to apply—to use, just add water and apply with standard garden equipment.

Efficient to use—nutrient benefits are readily available to plant.

Versatile—use for leaf feeding, starter solutions, seed treatment or side dressing.

Simple to handle—concentrated form makes lightweight, compact shipments.

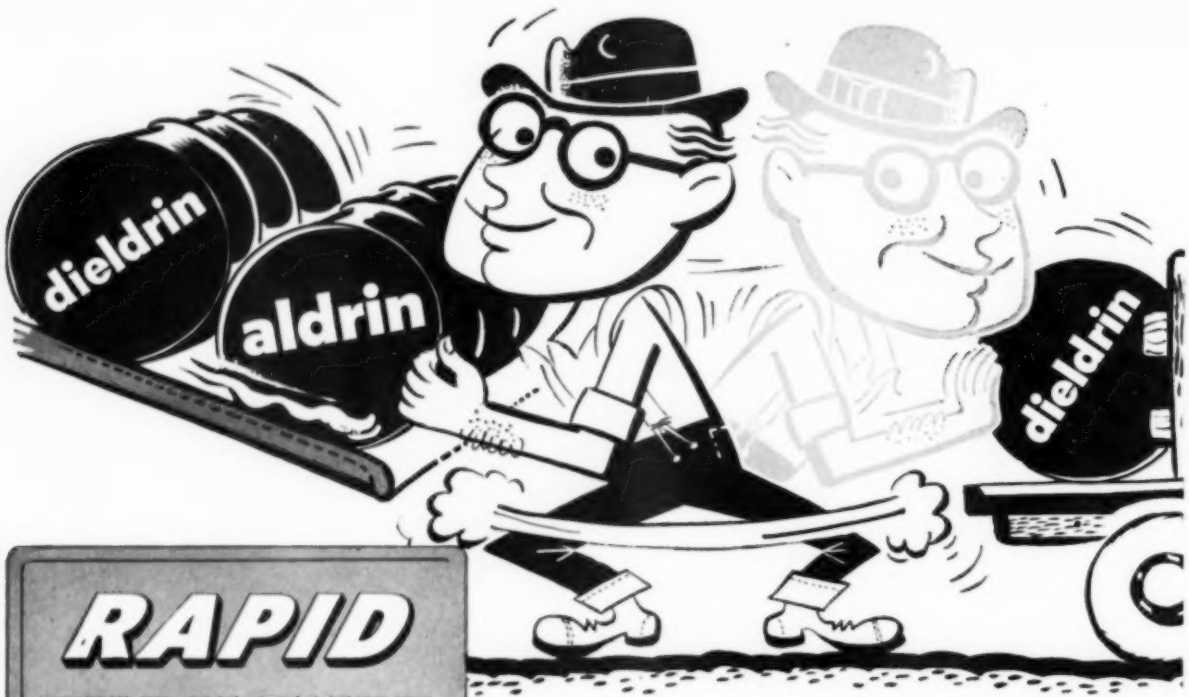
For more information, write MONSANTO CHEMICAL COMPANY, Phosphate Division, 1700 South Second Street, St. Louis 4, Missouri.

DISTRICT SALES OFFICES: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle, Twin Cities. In Canada, Monsanto Canada Limited, Montreal.

MONSANTO PLANT-NUTRIENT CHEMICALS			
	N	P_2O_5	K_2O
Monopotassium Phosphate (Crystals)	-0-	51.6%	34.2%
Diammonium Phosphate (Crystals)	21.0%	53.85%	-0-
Monoammonium Phosphate (Crystals)	12.2%	61.61%	-0-
Phosphoric Acid (75.0%) (Liquid)	-0-	54.5%	-0-

MONSANTO
CHEMICALS – PLASTICS

SERVING INDUSTRY · WHICH SERVES MANKIND



RAPID TURNOVER

Cotton growers demand more and more

...aldrin FOR FAST INSECT KILL

...dieldrin FOR LONG-LASTING ACTION

Aldrin and dieldrin, in use only a few years, have won the acclaim of growers throughout the cotton belt. In the 1952 season these insecticides proved real money makers for formulators. Powerful advertising and highly successful use have put aldrin and dieldrin in the high-turnover, high-profit class.

Aldrin with its fast-killing action and dieldrin with its long residual effectiveness are recommended for control of a wide number of agricultural and public health pests.

Shell offers complete technical service. Technical bulletins are available for detailed instructions on blending and processing, compatibility with other ingredients and the necessary safety precautions to be taken in handling these chemicals.

Send coupon for latest technical information on aldrin and dieldrin.

Aldrin-fertilizer mixture labels accepted by USDA

SHELL CHEMICAL CORPORATION
Julius Hyman & Company Division
P. O. Box 2171, Denver 1, Colorado

Please send me information on aldrin and dieldrin. I am interested in formulating insecticides for control of these pests (please list).

_____

Name _____

Address _____

_____

INDUSTRY *News*

NAC Fall Dates Set

Dates have been set for the 20th annual fall meeting of the National Agricultural Chemicals Association, according to Lea S. Hitchner, executive secretary and treasurer of the association, Washington, D. C.

As has been done for the past several years, the group will meet at the Essex and Sussex Hotel, Spring Lake, N. J., September 9 to 11, Mr. Hitchner says.

•

Calspray Honors A.W. Mohr

Arthur W. Mohr, president of California Spray-Chemical Corporation, Richmond, was honored by his company on March 27 in recognition of 30 years of service. Mr. Mohr, also president of the National Agricultural Chemicals Association, was given a gold watch at a luncheon in honor of himself and two other Calspray men of long service.

The other two were W. W. Layne, comptroller, and H. D. Huntsman, manager of the Richmond plant.

•

Ky. Fertilizer Tour in May

The Kentucky Green Pastures Spring Tour is to be held for three days beginning May 5, according to Lyle B. Leonard, field agent in soil conservation, Lexington. Beginning at Greenup, Ky. the tour will study fertilization of pastures in numerous counties of the state.

Calls Potash Inquiry

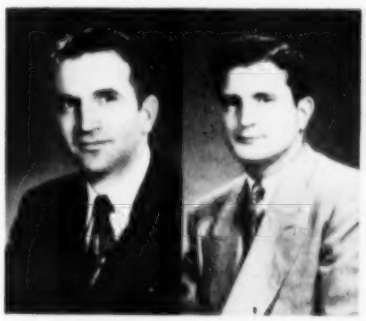
Rep. Charles B. Hoeven, (R., Ia.), chairman of the Fertilizer and Farm Machinery sub-committee of the House Committee on Agriculture, announced April 2 that his sub-committee will hold a hearing on Monday, April 20 to inquire into supplies of potash for fertilizer and particularly whether imports of potash are required.

Mr. Hoeven says that his sub-committee's interest in the matter stems from reports that considerable quantities of potash are being imported into the United States from behind the iron curtain.

Mr. Hoeven explains that potash is essential in the manufacture of fertilizer, and that practically all of our supply comes from mines in the southwestern States. He stated further that there have been no recent shortages of these materials for fertilizer usage.

Members of Mr. Hoeven's sub-committee are: Republicans: Ralph Harvey, Indiana; Page Belcher, Oklahoma; Clifford G. McIntire, Maine and William C. Wampler, Virginia. Democrats: Thomas G. Abernethy, Mississippi; E. C. Cathings, Arkansas; Carl Albert, Oklahoma; and James G. Polk, Ohio.

Spencer Names Two



BEASLEY MITCHELSON

Two new district agronomists have been added to the agronomy staff of Spencer Chemical Company. They are A. B. Beasley, mid-south district, and Billy Michelson, north-central district the company says.

Mr. Beasley will live in Memphis, Tenn., and Mr. Mitchelson in Minneapolis, Minn. The appointments represent an expansion in the Spencer district office program.

Mr. Beasley had been an agronomist with the Mid-South Soils & Farm Service, and before that was an agronomy instructor at the University of Tennessee. His first work was with the Soil Conservation Service, from 1944 to 1947. A Tennessee graduate, he received a Masters Degree in Agronomy in 1950.

Mr. Mitchelson, also a former employee of the Soil Conservation Service, was born and reared near Baxter Springs, Kas. He was graduated from Kansas State college in 1950 with a B.S. Degree in Agronomy. Before going to Spencer he was wtih the Charles Pfizer company and worked out of Fort Dodge, Ia.

Mr. Beasley will be working in Kentucky, Tennessee, Mississippi, Arkansas and Northern Louisiana, and Mr. Mitchelson in Minnesota, Iowa, Wisconsin and the Dakotas.

Western Cotton Conference

April 8 & 9 were the dates set for the Western Cotton Insect Control and Defoliation Conference, at the Westward Ho Hotel, Phoenix, Arizona. According to advance notices of the meeting, cotton growers were to hear discussions on how to increase efficiency of insect control and defoliation. Growers from the El Paso area of Texas, New Mexico, Arizona, California and Nevada were invited to attend.

Sessions during the first day were to deal with all phases of cotton insect control, with defoliation problems being discussed on the second day. One session was expected to feature discussions on the use of herbicides in cotton weed control.

Taking part in the conference program were to be authorities from federal and state agricultural agencies, insecticide and defoliant manufacturers, spray and dust applicators, and cotton industry representatives.

The Five-State Cotton Growers Association and the National Cotton Council are sponsors. Local host is the Arizona Cooperative Cotton Growers Association.

•

Waugh to P. R. Position

Nitrogen Division, Allied Chemical & Dye Corporation has announced the appointment of John D. Waugh as director of information for the Division.

In his newly-created post Mr. Waugh will be responsible for the information services, advertising and sales promotion activities. He will have his office at Division headquarters in New York.

•

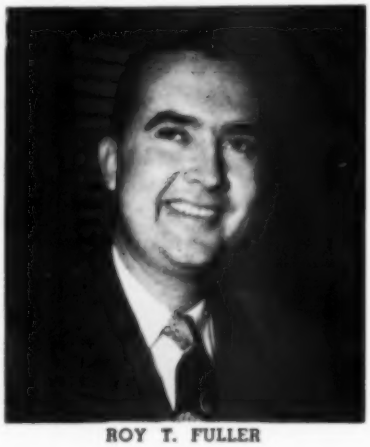
Conner in New Law Firm

John D. Conner, counsel for the National Agricultural Chemicals Association, has joined with Ashley Sellers, J. E. Baskette and G. A. Burroughs to form the law firm of Sellers & Conner, it has been announced. The new firm will have offices in the Cafritz Building, Washington, D. C. (Telephone STerling 3-0600).

Mr. Sellers was formerly associated with Carl McFarland, who is now president of Montana State University. Mr. McFarland will serve as counsel to the new firm.

•

Fuller Joins Spencer



ROY T. FULLER

Roy T. Fuller, Montgomery, Ala., has been appointed as Alabama sales representative for Spencer Chemical Co. Mr. Fuller previously was assistant county agent at Jasper, Ala., for two years; served as assistant agricultural editor for the Alabama extension service at Auburn one year, and was agricultural agent of the First National Bank at Jasper 19 months.

He was graduated from Alabama Polytechnic Institute at Auburn in 1946, with a B. S. degree in Agricultural Education. A veteran of World War II, Mr. Fuller served overseas for 31 months.

•

New J. P. Plant in Brazil

H. Alvin Smith, president of John Powell and Co., Inc., 1 Park Avenue, New York, has announced the establishment of a new unit in their expanding group of foreign offices and plants. The new company will be known as John Powell S. A. Comercio e Industria, with headquarters in Porto Alegre, Brazil.

Joining with Powell in the partnership arrangement are a Brazilian firm, and an American insecticide manufacturer. Operation of this Brazilian plant will be under the immediate supervision of Edwin B. Twyman, resident manager in Buenos Aires for John Powell and Company.

Installation of manufacturing facilities in the plant at Porto Alegre is already proceeding. The company will use its synergist "Sesamin," as well as piperonyl butoxide and other materials, in conjunction with pyrethrum, for the household and industrial fields, including formulations for the aerosol bomb. These materials and concentrates will be merchandised under the John Powell trademark "POWCO Brand."

•

S. C. Fertilizer Meeting

All fertilizer manufacturers, dealers, and salesmen are being invited to attend the annual South Carolina Fertilizer Meeting scheduled to be held July 16, 1953, at the Pee Dee Experiment Station, Florence, S. C. The group will make a tour of the station as part of the program and talks will be made by representatives of the experiment station and industry of the state, according to Dr. Bruce D. Cloaninger, head of the Department of Fertilizer Inspection and Analysis, Clemson Agricultural College, Clemson, S. C.

•

Opens Two New Offices

Two new district sales offices have been opened by Bradley & Baker at Indianapolis, Ind. and Houston, Texas. In charge of the Indianapolis office will be Everett C. Horne who formerly handled fertilizer sales from the company's St. Louis office. B. & B.'s representative at Houston will be James K. Sparkman, Jr.

Succeeding Mr. Horne at St. Louis, will be Thomas C. White who will handle fertilizer sales in the midwestern area west of the Mississippi.

The company's main office is at 155 East 44th St., New York City.

•

Mason to Thurston Post

William R. Thurston, president of Thurston Chemical Company, Joplin, Missouri has announced the appointment of William H. Mason as assistant to H. A. Gray, vice-president in charge of sales.

Mr. Mason has had twenty years experience in the fertilizer industry. From 1933 to 1951 he was associated with the Naco Fertilizer Company of New York, starting as assistant to the general manager in the New York office.

From 1937 to 1939 he acted as assistant manager of the company's

plant in San Juan, Puerto Rico. From 1939 to 1951 he served as assistant manager and manager of Naco's Findlay, Ohio plant. For the past two years he has been associated with the Smith-Douglass Company in Streator, Illinois. Mr. Mason will now coordinate activities between the sales and production departments and will conduct special surveys dealing with sales and production problems.

•

Jim Shafer, Pratt, Retires

J. I. Shafer, vice-president in charge of sales for B. G. Pratt Co., Hackensack, N. J., was to retire on April 3, after a 33-year career with the company.

Mr. Shafer joined the Pratt Co. in August, 1920, as a salesman and worked up through the ranks to his present position of vice-president. He was an active participant in the affairs of the National Agricultural Chemicals Association, being secretary of many NAC golf tournaments and acting on various special committees.

After April he was to be located at 1201 Gulf-to-Bay Blvd., Clearwater, Florida, where he expects to put into good use his ceramics hobby. He has announced that he will sell ceramics of various types and expects to give instruction in the art.

•

Offers New Applicator

A new model anhydrous ammonia applicator, called the "Double-Duty" has been announced by the KBH Corporation, Clarksdale, Miss.

The new applicator is said to be versatile, with the ability to travel on roads and give high production. When hard soil or hilly land are encountered, the main beam extensions can be folded up. In this position, the applicator's overall width is 7 feet 9 inches. It will then handle two rows or three middles, with 36 to 42 inch spacings. For preplanting and pasture work, 7 knives may be spaced 12 inches apart, or fewer knives if a wider spacing is desired.

With the main beam extensions lowered and locked, the applicator has a span of 14 feet 5 inches. The change to either position requires only a few minutes.

•

Amend to Wyandotte

NORMAN AMEND

Appointment of Norman Amend as assistant manager, Organic Chemicals, Michigan Alkali Division—Sales, Wyandotte Chemicals Corporation, has been announced by Howard F. Roderick, director of sales. Mr. Amend is a graduate of the Colorado School of Mines and came to Wyandotte in 1952 as a technical service representative.

During World War II, he served in the Engineers Corps, U. S. Army and, immediately prior to joining Wyandotte, was in the special products department of the Buffalo Electro-Chemical Company.

In his new position, Mr. Amend succeeds R. K. Rigger, recently named manager of Wyandotte's new Synthetic Detergents Department.

•

Am. Potash Names Three

Three new appointments in the sales department of American Potash & Chemical Corporation have been announced by Wm. J. F. Francis, general sales manager, Western.

Harold J. Bensinger has been named sales manager, Heavy Chemicals Department, Western; Albert F. Swain was appointed sales manager, Agricultural Chemicals Department, Western; and George A. Schnier becomes sales manager, Refrigerants Department, Western.

Mr. Bensinger had served for the past six years as assistant sales manager of the Western office of American Potash & Chemical Corporation.

Mr. Swain had held an executive position since 1945 in Eston Chemicals, Inc., of Los Angeles, which was acquired by American Potash and Chemical Corporation during the past year. Earlier, he had been with E. I. du Pont de Nemours & Company at El Monte, California; Sherwin-Williams Co. of Oakland; and the California Citrus Experimental Station, Riverside, California. A graduate of Stanford, Mr. Swain also received an MA degree in Entomology from the University of California.

Mr. Schnier had been with Eston Chemicals, Inc. since September, 1951.

•

Opens Office in Calif.

United Chemical Co., Heckathorn & Co., and the Agricultural Chemicals Service Co., Richmond, California announce the opening of a new service office and warehouse in Tulare, California. They now have seven offices in the west to bring service closer to all farm areas, and this office is expected to unify the services of the three companies in the San Joaquin Valley.

J. T. Vedder, manager of the Bakersfield office, and James Lamont, manager of the Fresno office, will use Tulare as a base for closer cooperation throughout the valley. They will maintain Fresno and Bakersfield telephones to facilitate orders and deliveries.

Al Woolsey, who started with the three companies in Richmond, and later moved to the Pomona office, was moved to Tulare to cordinate office and warehouse activities.

Other sales and service offices of the three companies are maintained in Sacramento, Bakersfield, Fresno, and Pomona, California, and Yakima, Washington. They manufacture and distribute a complete line of agricultural chemicals and fertilizers in the five western states.

•

Forms Own Company

Henry R. Interdonati, formerly with George Uhe Co., New York, has organized his own firm as a broker, sales agent and consultant, specializing in industrial chemicals and insecticides. He will headquarter at 855 Sixth Ave., NYC.

Formulators & Dust Mixers..

Now...Get Your DDD TDE Requirements From GENERAL CHEMICAL

...the "one-stop" source for all your important Base Materials & Toxicants

With full-scale commercial production of DDD (TDE) at its Marcus Hook, Pa., plant, General Chemical has provided formulators with a reliable new source of this increasingly important organic insecticide.

Now you can obtain your DDD technical and dust base requirements from the *same* producer which has long been a major supplier of DDT, Arsenicals, BHC, Lindane, Potassium Cyanate and other base materials for agricultural insecticides, fungicides and herbicides.

For your DDD needs—or for any of the other toxicants listed here—write or phone any of General Chemical's offices located from coast to coast.

DDD (TDE)
Technical, Flake
Dust Base (50% DDD)

DDT
Technical, Flake or Granular
Dust Base, 50% & 75%

BHC
Technical (15%, 36% & 90% Gamma)
Dust Base, 12% Gamma

LINDANE
Technical
Dust Base, 25%, 75%, 95%
Emulsifiable Concentrate, 20%
Oil Concentrate 20%

ORGANIC MITICIDES
"Aramite"
Genite* 883 (p-chlorophenyl p-chlorobenzene sulfonate)
Genite 923 (2,4-Dichlorophenyl Ester"Benzene Sulfonic Acid)

LEAD ARSENATE
Standard
Astringent
Basic

CALCIUM ARSENATE
Standard
Low Lime

PARATHION
Dust Base, 25% Emulsifiable, 2 & 4 lbs. per gallon

FERBAM
Dust Base (76% Ferric Dimethyl Dithiocarbamate)

ZIRAM
Dust Base (76% Zinc Dimethyl Dithiocarbamate)

2,4-D
Acid, and Technical Esters

2,4,5-T
Acid, and Technical Esters

TCA · SODIUM SALT
90% Dry Powder
50% Liquid Concentrate

POTASSIUM CYANATE
Technical
Cotton Defoliant
Weed Killer

DINITRO
Pre-Emergence Herbicides

CHLORO IPC
Pre-Emergence Herbicide

*Reg. U. S. Pat. Off.

GC Allied Chemical

Agricultural Chemical Department

GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Serving Agriculture from Coast to Coast

IMC Corp. Advances Two

Louis Ware, president of International Minerals & Chemical Corporation, has announced that effective July 1, 1953, R. B. Fuller, presently manager of the IMC Florida Phosphate Department, will be made assistant to the vice-president in charge of the Phosphate Division. Mr. Fuller will work on special assignments and will be directly responsible to George W. Moyers, vice-president.

He also announced that effective July 1, 1953, F. B. Bowen, presently manager of the Tennessee Phosphate Department, will become manager of the Florida Phosphate Department to assume responsibilities relinquished by Mr. Fuller.

•

Pacific APS Meets in June

The Pacific Division of the American Phytopathological Society will hold its 35th annual meeting on June 17, 18 & 19 at Santa Barbara, California, according to Roy A. Young, Oregon State College, Corvallis, secretary-treasurer of the Division. Mr. Young states that the meeting will be held in conjunction with the convention of the American Association for the Advancement of Science.

Tentatively, he said, formal papers and symposia are scheduled for the first two days of the meeting, with a field trip being planned for June 19.

•

CFA Committee to Meet

The first annual Fertilizer Conference to be sponsored by the Soil Improvement Committee of the California Fertilizer Association, will be held at the Hotel Marysville, Marysville, Calif., May 7 & 8, 1953, according to Sidney H. Bierly, executive secretary of the Association.

Program plans call for technical discussions, showing colored slides indicating response to various plant food materials and deficiency symptoms. Representatives of industry, the University of California and the U. S. Department of Agriculture will participate in the meeting. In connection with the meeting, the Agricultural Extension Service, University of California, is arranging a field trip to fertilizer experiment plots.

•

Geigy Appoints Two

Two changes in the sales organization of its Insecticide Division have been announced by Geigy Co., Inc., New York. Both appointments are in the company's northeast territory. G. D. Baerman has been made territorial manager and Calvin A. Hoadley, sales representative in New York State and southern New England.

Mr. Baerman, a resident of Princeton, N. J. and a graduate of Rutgers University, was formerly with Shell Chemical Corp. and Naco Fertilizer Co. before joining Geigy Company, Inc. last year.

Mr. Hoadley, of Naugatuck, Conn. is a graduate of Connecticut State College and was employed by Naugatuck Chemicals Division of U. S. Rubber Co.

For Paints...
For Varnishes...
For Lacquers...
PICCO
offers a complete line of
high quality, dependably uniform
SOLVENTS
and
SOLVENT OILS
PICCO Coal Tar Aromatic Solvents are available in a complete series of grades, from low to high boiling points, each grade being carefully fractionated to closely maintain specifications.
Complete data on all grades, and samples for testing, will be sent upon request. Please specify application.
PENNSYLVANIA INDUSTRIAL CHEMICAL CORP.
CLAIRTON, PENNSYLVANIA
Plants at Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.

SEWN OPEN MOUTH

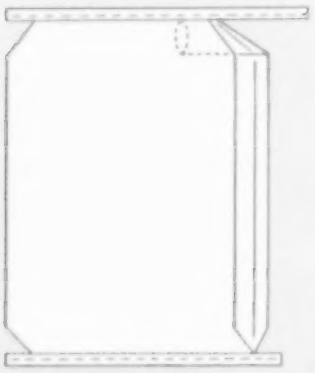
After the bag is filled, it is closed by sewing, stapling, wire tying, gluing or by using wide gummed tape. The bottom closure is made in the V-C bag factory.

SEWN VALVE

Bag is filled through a small opening or valve at the top. When the bag is full, the valve closes automatically. Recommended for coarse, bulky products.

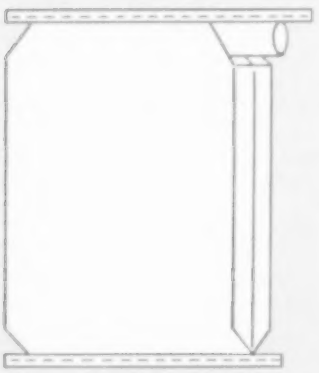
SEWN VALVE WITH SLEEVE

Similar to sewn valve type except that the valve has an extended inner sleeve. This eliminates sifting of finely-ground, dusty materials.



SEWN VALVE WITH TUCK-IN SLEEVE

After the bag is filled, the sleeve is manually folded into the valve pocket under the sleeve, thus forming a secure closure.



Which V-C® Multiwall Bag is Best for You?

Packaging is easier and more economical when you use the right type of multiwall bag. Each type has advantages for special kinds of jobs. If you have not reviewed your packaging requirements lately, it will pay you to consult a specially-trained V-C representative. Without cost or obligation, he will make recommendations that may save you money.

V-C Multiwall Bags are made of top-quality materials, carefully constructed to stand rough, tough treatment. In addition, V-C is prepared to make suggestions on how to modernize your trade design to give it extra sales appeal.

Expert designing, highest quality bag materials, painstaking construction, careful printing, speedy service and delivery . . . all of these add up to unqualified satisfaction. That's what you get when you use V-C Multiwall Bags.

Virginia-Carolina Chemical Corporation

BAG DIVISION: 9th and Perry Streets, Richmond, Virginia

DISTRICT SALES OFFICES:

Atlanta, Ga. • Wilmington, N. C. • E. St. Louis, Ill. • Cincinnati, Ohio

NEWS

Brevities

EUROPEAN CORN BORER brought about losses to American agriculture estimated at $77 million in 1952, the U.S.D.A. states. The insect destroyed an estimated 53 million bushels of corn, equalling 1.7% of the 1952 corn crop.

•

NATIONAL SAFETY COUNCIL has issued its 1953 directory of occupational safety posters, showing miniatures of hundreds of posters available. Copies of the directory, 72-page are available at 50¢ from the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

•

GEORGE UHE CO., INC., New York, has announced that Frank Dollard has rejoined the organization to handle their sales of industrial chemicals, solvents and DDT.

•

THE CENTRAL CALIFORNIA AGRICULTURAL FORUM named O. D. McCutcheon, Kings County Farm Adviser as its president in the group's recent meeting at Fresno. Other officers elected: Tom Vedder, United Chemical Co., Bakersfield, vice-president; and W. D. McClellan, Mid-State Chemical Supply Co., Lindsay, secretary. The group, formed early in 1952, meets quarterly, alternating between Fresno and Bakersfield. Membership numbers 300; meetings include discussions of pest control and other problems peculiar to the area.

•

MATHIESON CHEMICAL CORP., Baltimore, Md., has appointed Thomas C. Keeling, Jr., as president of the firm's Hydrocarbon Chemicals Division. Mr. Keeling was formerly associated with Koppers Co., Inc., and for several months was with NPA in Washington.

JOHN M. DEMING has been named group leader, soils research, at Monsanto's Creve Coeur laboratories. He holds a Ph. D. in soil chemistry from Purdue University and B. S. in agricultural chemistry from Arizona U.

•

J. M. HUBER CO. has paid its employees $1,200,000 out of 1952 earnings under profit-sharing and retirement plans. Every employee in the 23 states where Huber operates shares in the plan, the company says.

•

INTERNATIONAL MINERALS & CHEMICAL CORP., Chicago, will assist employees in continuing their educational pursuits, Louis Ware, president, has announced. Employees with a year or more of continuous service may apply for aid in paying for collegiate, professional or semi-professional education relating to their work. The company pays half of tuition, registration, laboratory fees.

•

HAMMOND BAG & PAPER CO. has appointed G. A. Martin as special sales representative to represent the firm in Michigan, Ohio, Kentucky and southern West Virginia. He will work out of the general office at Wellsburg, W. Va.

•

PHILLIPS CHEMICAL CO. is starting construction of new facilities to make nitric acid, at its Cactus plant, Etter, Texas. New facilities will augment present capacity by 110 tons a day. Work will be completed late this year. Since taking over Cactus Ordnance Works in 1948, Phillips has doubled ammonia production capacity and added nitric acid facilities.

A CONFERENCE REPORT on cotton insect research and control has been issued by the U. S. Dept. of Agriculture. It summarizes results of six conferences held at Stoneville, Miss.; Baton Rouge, La.; Jackson, Miss.; and three at Memphis, Tenn. The report was compiled by B.E.P.Q. in cooperation with the 13 cotton-growing states.

•

MARIETTA CONCRETE CORP. is starting construction on a new plant at Hollywood, Florida, which will manufacture mortarless concrete blocks, and agricultural and industrial silos. To be known as Marietta Concrete Corporation of Florida, the new plant will be headed by F. L. Christy, president of the parent corporatation, Marietta, Ohio.

•

FULTON BAG & COTTON MILLS plans a new multiwall bag plant for St. Louis. The new building will be a single-story structure with 50,000 square feet of floor space and facilities for offices, manufacturing and warehousing. It is expected to be in operation by the end of summer. Fulton has also named Kenneth R. Kerr as assistant manager of its plant in Denver, Colo.

•

JAMES E. TOTMAN, president, Summers Fertilizer Co., Baltimore, and Mrs. Totman returned recently from a two months' trip abroad which included a cruise on the Mediterannean and a business trip to Cairo, Egypt; Madrid and Paris. He reports that the overall picture in the fertilizer trade is none too bright, with overproduction of certain fertilizer raw materials prevailing. Rapid expansion of facilities plus a restricted domestic and export demand has contributed to the surpluses.

•

AMERICAN POTASH & CHEMICAL CORP. has announced the near completion of its new research laboratory at Whittier, Calif. To be in charge of the new installation is W. A. Gale, director of research, for 30 years with the firm at Trona, Calif. He will move his headquarters to Whittier from which place he will

DAVCO*

GRANULATED SUPERPHOSPHATE

OFFERS YOU 3-WAY CONTROL

- **STORAGE CONTROL—No caking or lumping while in storage.**
- **APPLICATION CONTROL—No dusting or bridging; drills free and even.**
- **FOOD CONTROL—Supplies plant food at a uniform rate.**

You can actually see and feel the difference in DAVCO Granulated Superphosphate. You and your customers can tell why Granulated Superphosphate will not cake no matter how long it is kept in storage. And you can see the reasons for its ease in drilling . . . the fact that it will not dust nor bridge over. Granulated Superphosphate drills freely and evenly in the field giving complete coverage. And because of the granular structure, plant food is released at desirable rates.

DAVCO GRANULATED SUPERPHOSPHATE gives the added points which can make a sale and in turn will keep that customer sold. Order your superphosphate now, but be sure it is DAVCO GRANULATED SUPERPHOSPHATE WITH THE 3-WAY CONTROL.

*Reg. T M

Progress Through Chemistry

THE DAVISON CHEMICAL CORPORATION

BALTIMORE 3, MARYLAND

PRODUCERS OF: CATALYSTS, INORGANIC ACIDS, SUPERPHOSPHATES, PHOSPHATE ROCK, SILICA GELS AND SILICOFLUORIDES. SOLE PRODUCERS OF DAVCO GRANULATED FERTILIZERS.

supervise over-all policy of the Trona lab as well as running the new unit at Whittier. Research activities of the Eston Division will be transferred to Whittier, under supervision of Dr. W. D. Peterson.

•

GENERAL CHEMICAL DIVISION, Allied Chemical & Dye Corp. will build a new research laboratory at Morristown, N. J. to replace the present laboratory at Laurel Hill, New York. Much of the research will be devoted to agricultural insecticides, fungicides, weed killers. The building will be three stories, with 50,000 square feet of floor space.

•

E. RAUGH & SONS FERTILIZER Co., Indianapolis, has named Charles S. Raugh chairman of its board; S. J. Martenet, president and director; R. D. Martenet, executive vice-president & director; L. E. Little, vice-president, production; Helen M. Lee, secretary; John J. Weldon, treasurer and director. L. E. Little and D. L. Chambers, Jr., were added to the board roster.

•

TENNESSEE PRODUCTS & CHEMICAL CORP., Nashville, Tenn., has appointed Eugene F. Allen as manager of the market development and research department. Mr. Allen was formerly with Monsanto Chemical Co. and McKesson & Robbins, Inc.

•

A FINE OF $50 was assessed against George Hodges, Jersey City, N. J. on March 23 for his possession of four false measures used to determine the quantity of dirt in fertilizer he was selling.

•

R. L. ZACHRY has been made director of the Quality Control Division of Fulton Bag & Cotton Mills, Atlanta, Ga. He has been with the firm 39 years.

•

K. B. STUART has been made general manager of coke and chemical sales for Colorado Fuel and Iron Corporation, Denver, Colo. He started with the firm in 1929 and became manager of chemical sales in 1943.

ORGANIC FERTILIZER as a by-product from methane gas production in South America is a possibility, according to reports from Brazil. A small pilot plant has been set up to produce gas from vegetable residues such as dried leaves, fruit skins, garbage and other materials. Production will be 36,000 cubic feet a month.

•

WILLIAM W. SKINNER, formerly with the U.S.D.A. as chief of the Bureau of Agricultural and Industrial Chemistry, died March 10 at Olney, Maryland.

•

THE FERTILIZER INDUSTRY is keeping a weather eye on developments which so far have seen the Army withdrawing from private operations a number of leased army-owned tank cars fitted to carry sulfuric acid. Whether this may continue or not was not known at press time.

TC TENNESSEE CORPORATION

MINERAL SALTS

One of the country's foremost producers of Agricultural Chemicals and Soluble Mineral Salts.

Tennessee's trace minerals are soluble and their nutritional value is immediately available to the plant. Soluble trace minerals are more economical and faster acting.

For MANUFACTURERS, MIXERS and CHEMISTS

We can supply you with most any combination of mineral mixtures—mixed to your own specifications. Soluble Manganese, Copper, Zinc, Iron, Boron and Magnesium. Producers of— ES-MIN-EL

TRI-BASIC COPPER SULPHATE

COP-O-ZINC

NU-Z

TRI-BASIC

TRI-BASIC Copper Sulphate is a chemically stable copper fungicide containing not less than 53% metallic copper. TRI-BASIC Copper Sulphate can be used as a spray or dust on practically all truck crops and citrus crops. Control persistent fungus diseases — correct copper deficiencies from a nutritional standpoint. Use TC TRI-BASIC Copper Sulphate.

COP-O-ZINC

COP-O-ZINC is a new, neutral copper-zinc fungicide containing 42% copper and 11% zinc. COP-O-ZINC gives a superior performance in control of fungus diseases. COP-O-ZINC composition of two essential elements gives it added value in correcting deficiencies of zinc and copper and in stimulating plant growth. COP-O-ZINC is compatible with all inorganic and organic insecticides. No lime is required. For use in spraying or dusting.

NU-Z

NU-Z contains 52% metallic zinc. It is a neutral zinc compound which does not require the addition of lime for direct foliage application. NU-Z gives excellent coverage and adherence to plant foliage, thus rendering it available over a longer period of time. Safe for direct application. For zinc deficiency and plant nutrition — use as spray or dust.

For detailed information, phone, wire or write —

TC TENNESSEE CORPORATION

617-29 Grant Building, Atlanta, Georgia

Sell

these 4 Sinox Dinitro Products

SINOX
SINOX W
SINOX PE
SINOX GENERAL

FOR THESE 4 TYPES OF WEED CONTROL:

PRE-EMERGENCE
SELECTIVE
PRE-HARVEST
CHEMICAL WEED MOWING

After 15 years of research and development we now offer SINOX — the original dinitro weed killer — in 4 formulations to give you added sales in all 4 types of weed control. Write for prices, marketing agreement and other information today.

SINOX

For safe, selective weed control in onions, flax and grain.

SINOX PE

For pre-emergence spraying of cotton, beans and peas; early summer treatment of alfalfa and clover.

SINOX W

For selective spraying of seedling alfalfa, onions, flax and grain; also as preharvest spray on alfalfa, milo, peas, flax, castor beans, sudan grass and clover.

SINOX GENERAL

For chemical weed mowing in orchards, vineyards, ditches and roadsides. Preharvest spraying, potato vine killing, and for use in established alfalfa and strawberries.

other Standard Agricultural Chemical Products

HERBICIDES

STANTOX "64"
2,4-D Amine Salt
STANTOX "P-44"
2,4-D Ester
STANTOX "P-50"
Low volatile 2,4-D Ester
STANTOX "T-45"
2,4,5-T Ester
STANTOX "22" BRUSH KILLER
Low volatile esters of 2,4-D & 2,4,5-T
STANTOX "LV-45"
Low volatile 2,4,5-T Ester
STANTOX "SODIUM TCA" (90%)
STANTOX MCP
STANTOX IPC
STANTOX CHLORO IPC

DORMANT FRUIT SPRAYS

ELGETOL
ELGETOL "30"
ELGETOL "318"

INSECTICIDES

STANPHOS "50"
TOXAPHENE EMULSION
DDT EMULSION
PARATHION EMULSION
PARATHION WETTABLE POWDER
STANICIDE
and others

STANDARD AGRICULTURAL CHEMICALS, Inc.
1301 Jefferson Street, Hoboken, N. J. · 420 Forum Building, Sacramento, Calif.

LISTENING *Post*

Chemical Control of Tree Leaf Diseases

This department, which reviews current plant disease and insect control problems, is a regular monthly feature of AGRICULTURAL CHEMICALS. The comments on current plant disease problems are based on observations submitted by collaborators of the Plant Disease Survey Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture, Beltsville, Md.

By Paul R. Miller

J. C. CARTER and P. F. Hoffman of the Illinois State Natural History Survey report results of fungicide tests for control of leaf diseases of black walnut, catalpa, and American elm in Illinois.

In 1951, six fungicides were tested on black walnut and four on catalpa and during the following season, 13 fungicides were tested on American elm for control of leaf diseases. In 1951, applications were made on June 13 and July 3; in 1952, on May 29 and June 20. Tables 1, 2, and 3 show the materials tested and the degrees of disease control obtained on walnut, catalpa, and elm. Leaf spot of walnut *(Marssonina juglandis)* and leaf spot of catalpa *(Alpernaria catalpae)* appeared during early August, 1951, and data on control of each disease were recorded in early September. Black leaf-spot of elm *(Gnomonia ulmea)* appeared during early July, 1952, and disease readings were made in August. Leaf spot was less on sprayed trees than on unsprayed trees.

Walnut trees (Table 1) sprayed with "Puratized Agricultural Spray" had the least amount of leaf spot, 94.6 percent less than the unsprayed trees or an average of 1.1 spots per leaflet. The unsprayed trees had an average of 20.3 spots per leaflet. Pronounced defoliation of the unsprayed trees was estimated at 60 percent. Defoliation on sprayed trees varied from an estimated 3 percent for those treated with "Puratized Agricultural Spray" to 15 percent for those treated with Mathieson Chemical Corporation "Experimental Fungicide 466-C." None of the materials caused foliage burn, but "Experimental Fungicide 466-C" caused abundant leaf roll. "Fermate," which appeared to have been taken into the tissues of the leaflets, caused dark brown discoloration of tissues between the veins on the under side of some leaflets on one tree. Insufficient infection in 1952 prevented the estimation of fungicidal effectiveness.

Catalpa trees (Table 2) sprayed with Carbide and Carbon Chemical Co. Division "Experimental Fungicide 640" and Mathieson Chemical Corporation "Experimental Fungicide 466-C" had the least amount of leaf spot. Those sprayed with "Experimental Fungicide 640" had 66.7 percent less leaf spot and those sprayed with "Experimental Fungicide 466-C," had 63.6 percent less than the unsprayed trees. The unsprayed trees had an average of 48.3 spots per leaf. None of the materials caused foliage burn or premature defoliation.

American elms (Table 3) sprayed with "Tag 331" had no leaf spot. Unsprayed trees had an average of 45.2 percent of the foliage surface affected with leaf spot. "Phygon," "Puratized Agricultural Spray," "Vancide 51," and "Parzate" were next in order of effectiveness. "Experimental Fungicide 5400" and the two organic mercuries, "Tag 331" and "Puratized Agricultural Spray," caused a small amount of browning of foliage.

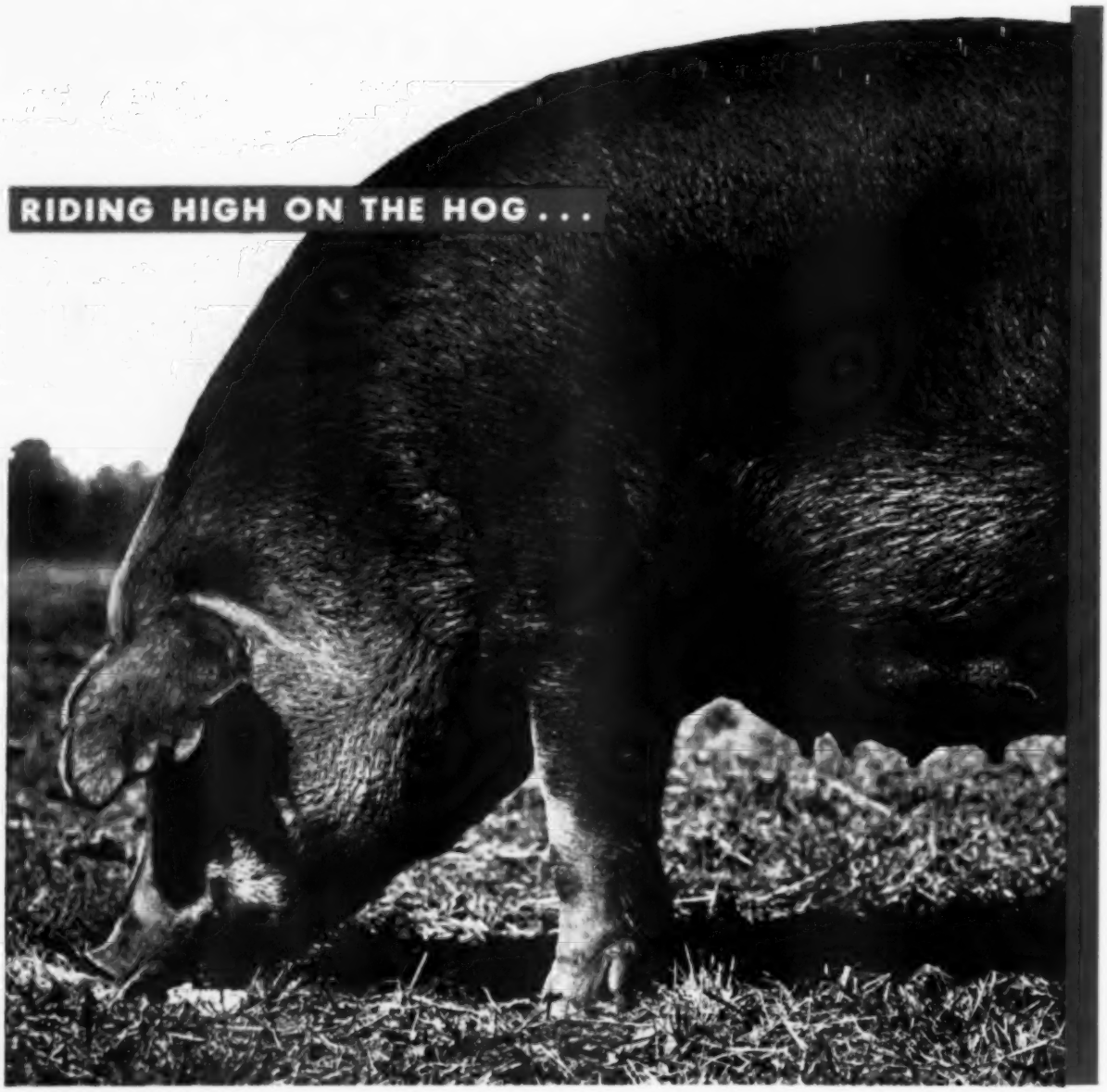
Sycamore Disease Control

RESULTS of fungicide tests for control of sycamore anthracnose in Illinois in 1952 are reported by P. F. Hoffman, of the Illinois State Natural History Survey. Ten fun-

TABLE 1
Fungicides tested on walnut and control of leaf spot (Marssonina juglandis) obtained in 1951. Experiments in Illinois

Sprays used Fungicide	Amount per 100 gallons	Average number of disease spots per leaflet	Reduction in leaf spot number, as percent	Estimated defoliation, as percent
Puratized Agricultural Spray	1 pt.	1.1	94.6	3
Vancide 51	4 pt.	6.4	68.5	5
Orthocide 406	2 lb.	9.6	52.7	10
Fermate	2 lb.	11.4	43.8	5
Experimental Fungicide 640[a]	2 lb.	12.4	38.9	3
Experimental Fungicide 466-C[b]	3 oz.	15.1	25.6	15
Untreated		20.3		60

[a]Product of Carbide and Carbon Chemicals Division, Union Carbide and Carbon Corporation.
[b]Product of Mathieson Chemical Corporation.



is the promise of food for millions and a fair profit for the farmer. From shoat to slaughterhouse, hogs are fattened with prime feeds to produce top quality pork. The farmer uses his knowledge, the soil its strength, to put meat on the tables of the families of the world.

As the work of the farmer is repaid in profits, so must the efforts of the soil be repaid. For, from the soil comes strength for growing crops, the vital plant-food elements that nourish all life. And to the soil these elements must be restored.

Many of the most effective fertilizers contain POTASH, often Sunshine State Potash, a product of New Mexico. Potash adds vital food elements to the soil and helps strengthen crop resistance to drought and disease. Widely used, POTASH proves a valuable aid in producing bigger profits, proves a good business investment.

SUNSHINE STATE POTASH
PRODUCT OF NEW MEXICO U.S.A.

REG. U. S. PAT. OFF.

HIGRADE MURIATE OF POTASH 62/63% K_2O
GRANULAR MURIATE OF POTASH 48/52% K_2O
MANURE SALTS 20% K_2O MIN.

UNITED STATES POTASH COMPANY, Incorporated, 30 Rockefeller Plaza, New York 20, N. Y.

TABLE 2

Fungicides tested on catalpa and control of leaf spot (Alternaria catalpae) obtained in 1951. Experiments in Illinois

Sprays used Fungicide	Amount per 100 gallons	Average number of disease spots per leaflet	Reduction in leaf spot number, as percent
Experimental Fungicide 640[a]	2 lb.	16.1	66.7
Experimental Fungicide 466-C[b]	3 oz.	17.6	63.6
Vancide 51	4 pt.	25.9	46.4
Experimental Fungicide 723[b]	1 lb.	38.1	21.1
Untreated		48.3	

[a]Product of Carbide and Carbon Chemicals Division, Union Carbide and Carbon Corporation.
[b]Product of Mathieson Chemical Corporation.

TABLE 3

Fungicides tested on American elm and control of black leaf spot (Gnomonia ulmea) obtained in 1952. Experiments in Illinois

Sprays used Fungicide	Amount per 100 gallons	Percent of leaf surface infected per tree	Reduction in leaf surface infected, as percent
Tag 331	½ pt.	0.0	100.0
Phygon	1 lb.	6.1	86.5
Puratized Agricultural Spray	1 pt.	6.6	85.4
Vancide 51 & sticker	2 lb.	7.7	83.0
Parzate	2 lb.	9.4	79.2
Orthocide 406	2 lb.	13.6	69.9
Dithane Z-78	2 lb.	16.1	64.4
Experimental Fungicide 466[a]	½ lb.	16.8	62.8
Vancide 51 ZW	2 lb.	18.7	58.6
Fermate	2 lb.	25.0	44.7
Experimental Fungicide 5400[b]	2 lb.	30.5	32.5
Zerlate	2 lb.	32.7	27.6
Experimental Fungicide 640[b]	2 lb.	36.1	20.1
Untreated		45.2	

[a]Product of Mathieson Chemical Corporation.
[b]Product of Carbide and Carbon Chemicals Division, Union Carbide and Carbon Corporation.

TABLE 4

Fungicides tested on sycamore and control of anthracnose (Gnomonia veneta) obtained in 1952; five trees per treatment. Experiments in Illinois.

Sprays used Fungicide	Amount per 100 gallons	Percent of leaves blighted	Index of control
Puratized Agricultural Spray	1 pt.	6	82
Tag 331	½ pt.	9	73
Dithane Z-78	2 lb.	15	55
Fermate	2 lb.	18	45
Vancide 51 plus sticker	2 lb.	19	42
Phygon	1 lb.	19	42
Experimental Fungicide 640[a]	2 lb.	25	24
Zerlate	2 lb.	26	21
Experimental Fungicide 466-C[b]	½ lb.	32	3
Untreated		33	
Vancide 51-ZW	2 lb.	35	-6

[a]Product of Carbide and Carbon Chemicals Division, Union Carbide and Carbon Corporation.
[b]Product of Mathieson Chemical Corporation.

gicides were tested for control of anthracnose *(Gnomonia veneta)*. Applications were made on April 8, 22, and May 6, the first as a delayed dormant application, the others corresponding to the broken bud and young leaf stage of seasonal development of the host.

In 1952, in contrast with the preceding three years 1949, 1950, and 1951, when there was very little sycamore anthracnose in Illinois, the disease was prevalent throughout the State. Also, in 1952, anthracnose infection, in contrast with its usual tendency to appear as early leaf blight, became apparent for the most part at the time when the leaves had expanded fully. Twig and stem lesions were abundant; several 5- and 6-foot trees in experimental planting were killed by cankers that developed on their trunks.

Because of lack of infection in previous years, steps were taken to increase the incidence of anthracnose in the disease nursery by the mist-blown application of conidia of *Gnomonia*. Favorable weather, however, stimulated natural infection to such an extent that results of the artificial inoculations were masked.

Disease readings were taken on June 4. Only leaves showing actual infection were counted; therefore, the dead leaves on shoots that were killed by girdling cankers lower down on the stem were disregarded. Materials used and the degree of disease control obtained are shown in Table 4.

Two organic mercury compounds, "Puratized Agricultural Spray" and "Tag 331," were the most effective fungicides used against anthracnose. Leaf infection on trees treated with "Puratized Agricultural Spray" was estimated at 6 percent, on trees treated with "Tag 331" at 9 percent, in contrast with that on untreated trees, which was estimated at 33 percent. Defoliation of trees that received the best treatments was negligible; defoliation of the untreated trees was considerable.

Eight spray schedules were tested to determine the minimum num-

Niagara Dusts and Dusters

On Dollars Per Acre Returned

YOUR BEST INVESTMENT IN PROTECTION

Food processors, both freezers and canners, are most conscious of insect and disease injury as well as insect count in the produce they buy. Substandard crops bring substandard prices—or don't sell at all. You cannot afford to take a chance with inferior materials and ineffective methods of application.

Better growers everywhere use reliable, proved Niagara dusts and dusters for insect and blight control. They dust regularly from spring to fall, harvest the top grade crops—the clean crops that command premium prices from the packers.

For professional advice on the seasonal protection you need, consult your friendly Niagara field man, regularly. That's his job, to help you earn greater profits. Call him in now or write us and he will see you.

Niagara CHEMICAL DIVISION

FOOD MACHINERY AND CHEMICAL CORPORATION

Middleport, N. Y. Richmond, Calif., Jacksonville, Fla., Tampa, Fla., Pompano, Fla., New Orleans, La., Ayer, Mass., Greenville, Miss., Harlingen, Tex., Pecos, Tex., Yakima, Wash., **Subsidiary,** Pine Bluff Chemical Co., Pine Bluff, Ark., **Canadian Associate:** NIAGARA BRAND SPRAY CO., LTD., Burlington, Ontario.

WHEN YOU BUY Niagara YOU BUY PROTECTION

fmc Trade Mark

TABLE 5

Control of sycamore anthracnose obtained with different spray schedules in 1952; each schedule used on five trees with each fungicide. Experiments in Illinois.

Schedule[a]	Puratized Agricultural Spray		Fermate	
	Percent of leaves blighted	Index of control	Percent of leaves blighted	Index of control
Single sprays				
1	30	21	39	-5
2	10	74	19	49
3	30	21	33	11
Combinations				
1, 2	4	89	18	51
1, 2, 3	8	79	24	35
1, 3	28	26	30	19
2, 3	9	76	27	27
Untreated	38		37	

[a] 1—delayed dormant; 2—broken bud; 3—young leaf

ber and best combination of spray applications necessary for adequate control of sycamore anthracnose. Table 5 lists the schedules, materials used, and degree of disease control obtained.

Spray number 2, applied at the broken bud stage, appeared to be of greatest significance. In the absence of this application, disease control fell off sharply. If the disease can be consistently controlled by a single, properly timed application, spraying for the control of sycamore anthracnose should become more widespread.

Probable Infestations for 1953 are Listed

This column, reviewing current insect control programs, is a regular feature of AGRICULTURAL CHEMICALS. Mr. Dorward is connected with the Division of Insect Detection and Identification, Agricultural Research Administration, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Washington. His observations are based on latest reports from collaborators in the U.S.D.A.'s pest surveys throughout the United States.

By Kelvin Dorward

PINK bollworm which in 1952 did appreciable commercial damage to cotton in the United States, is now known to be in approximately 260 counties of Texas, Oklahoma, Louisiana, New Mexico and Arizona for the first time. During 1952, the cooperative pink bollworm survey showed 41 counties in Texas, 6 in Oklahoma, 1 in Louisiana, and 1 in Arizona to be newly infested. All of the newly infested counties are near or adjacent to the old quarantine areas. The accompanying map (P. 99) shows pink bollworm regulated areas as of January 1, 1953.

In relation to the pink bollworm situation, there is an encouraging note in that the proportionate number of live overwintering pink bollworms is lower than it was last year. A January 31 report stated that during January of this year, only 9 live pink bollworms were found in the examination of 770 old cotton bolls in Cameron County, Texas as compared to 71 live pink bollworms found one year ago in 835 old bolls. Last year, about 12 percent of the old bolls examined in Cameron County contained living pink bollworms, while this year, less than 1½ percent have them. Clean-up measures have played a large part in this reduction. Almost 100 percent of the old cotton stalks were destroyed in Cameron County by August 31, 1952, while in 1951, principally because of weather conditions, it was not possible to destroy the old stalks until the fall months.

ACCORDING to surveys conducted by the Grasshopper Control Project, there are not expected to be any widespread serious infestations of cropland grasshoppers in 1953. However, it is expected that several areas will have local, serious problems. This type of trouble is expected to occur in central South Dakota, northeastern Wisconsin, the panhandle of Texas, and central Utah. With favorable weather conditions during the summer, some trouble can be expected in southern Illinois, Indiana, and Ohio.

There is a possibility of crops in the central valley of California, central Idaho, and eastern Washington being invaded from grasshoppers breeding in surrounding range land. These invasions have become even more probable with a build up of *Melanoplus mexicanus* in the above states, with the exception of California. In California, the principal grasshopper is *Melanoplus devastator*. Recent surveys for eggs of this species, however, indicate some reduction in the infestation expected for 1953.

Range land grasshopper infestations in 1953 are expected to be the largest and most serious in northeastern New Mexico. This infestation extends into Oklahoma, Colorado and Texas. The States of Montana, Idaho, Washington, Oregon, Nevada, and Utah, will have severe range infestations, but not as much area will be involved as in the New Mexico infestation.

An unusual range infestation is expected in North Dakota. This infestation is unusual in that it involves hoppers that overwintered as nymphs. California, and Arizona have only small local range infesta-

AVAILABLE NOW

Good news! Phillips *66* Ammonium Sulfate is available *now!* It is *dry-cured*. Dry-curing removes excess moisture—prevents caking. Uniform crystals flow freely—mix easily. Contains 21% nitrogen. Ideal for mixed goods manufacture and for direct application for all farm crops.

Contact us now for immediate shipment of bulk or bagged Phillips *66* Ammonium Sulfate.

Phillips also produces Nitrogen Solutions, Ammonium Nitrate, and Anhydrous Ammonia. Write our nearest district office for full information.

PHILLIPS CHEMICAL COMPANY

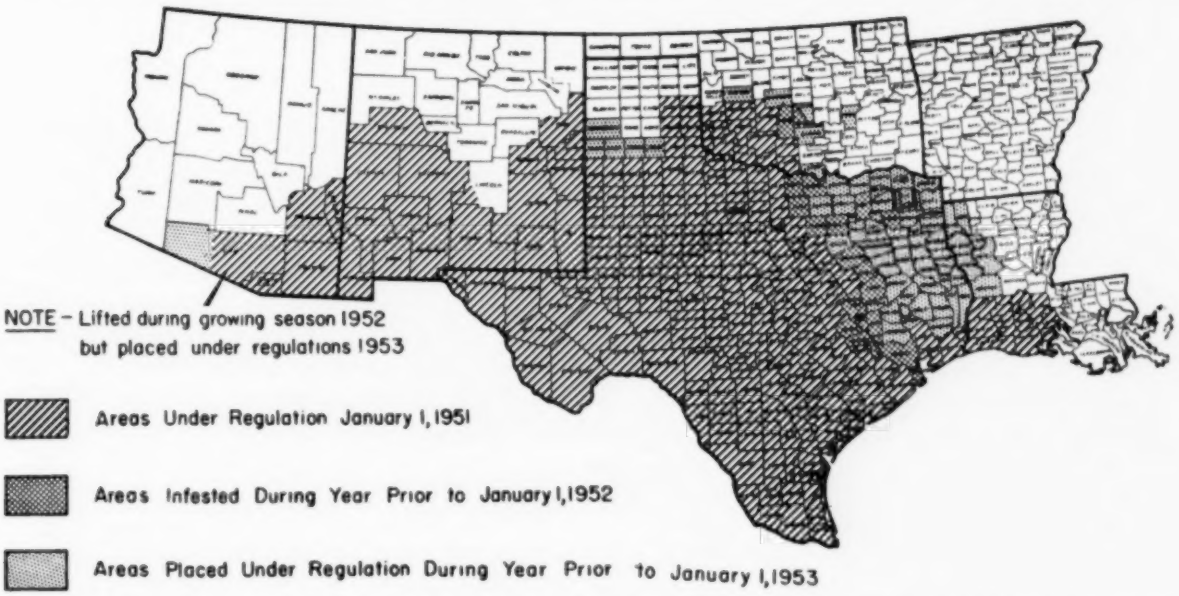
A Subsidiary of Phillips Petroleum Company

FERTILIZER SALES DIVISION · BARTLESVILLE, OKLAHOMA

DISTRICT SALES OFFICES:

NORFOLK, VA.—610 Royster Bldg. • TAMPA, FLA.—7 Terrace Office Bldg.
HOUSTON, TEX.—604 City National Bank Bldg. • AMARILLO, TEX.—First National Bank Bldg. • OMAHA, NEB.—WOW Bldg.
PASADENA, CALIF.—604 Citizens Bank Bldg. • NEW YORK, N. Y.—80 Broadway • BARTLESVILLE, OKLA.—Adams Bldg.

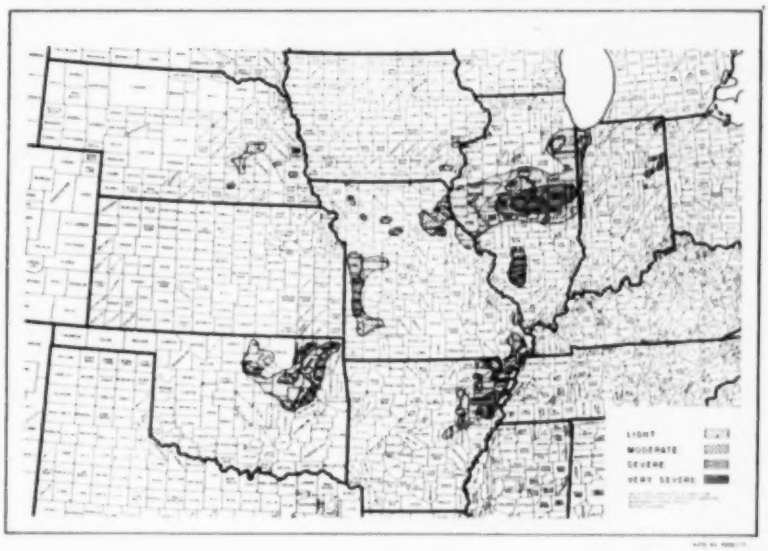
Pink Bollworm Regulated Areas - January 1, 1953


NOTE – Lifted during growing season 1952
but placed under regulations 1953
Areas Under Regulation January 1, 1951
Areas Infested During Year Prior to January 1, 1952
Areas Placed Under Regulation During Year Prior to January 1, 1953

tions remaining to threaten ranges. However, an infestation involving range lands south of the Seligman, Arizona area, remains a threat.

Optimum conditions for survival and development of Mormon crickets prevailed throughout the intermountain region of the West in 1952. There were substantial build-ups in many of the old Mormon cricket areas. Despite extensive and successful control efforts in 1952, heavy Mormon cricket infestations are expected in 1953 in the northern half of Nevada and in Tooele County, Utah. Smaller, but heavy infestations are expected in Idaho, Oregon, California, Montana, Colorado, and Wyoming. The existing infestations are vigorous and indicate a strong tendency to continue a full scale build-up similar to that experienced during the '30's.

Chinch Bug Infestation Fall, 1952

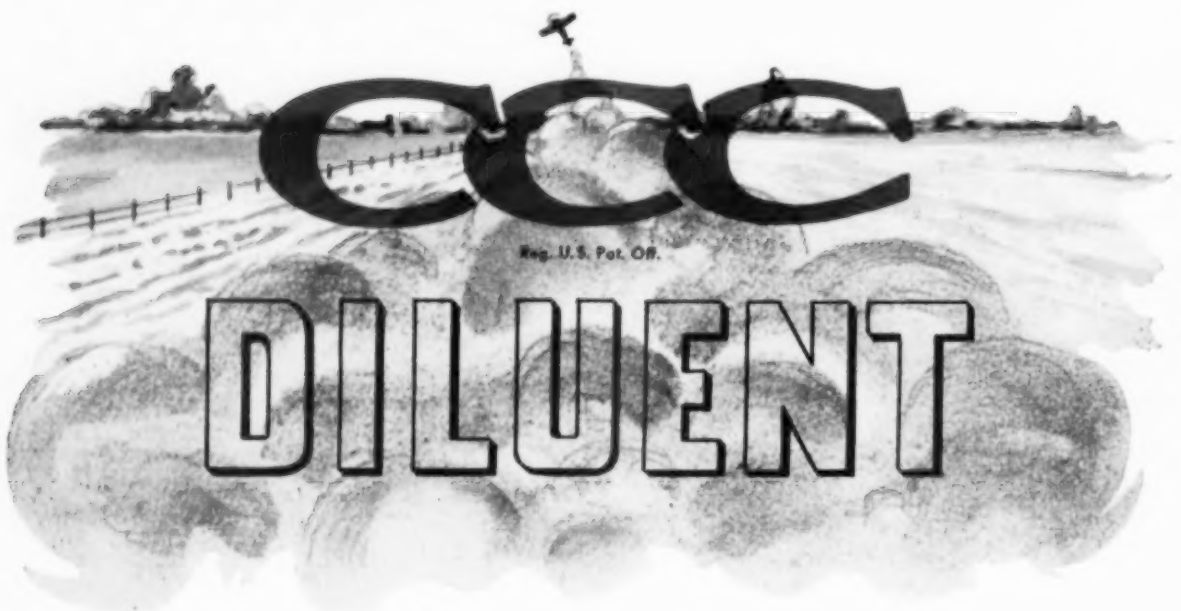


The number of chinch bugs going into hibernation during the fall of 1952 was greater in some states than in the past several years. This was particularly true in Oklahoma, Arkansas, Missouri, and Illinois. The Oklahoma fall chinch bug survey showed the heaviest hibernation in that state since 1948, with the concentration being in the northeastern section.

The east central area is the principal section of increase in Illinois, while in Arkansas, the northeast corner is involved. The heaviest infestations in Missouri are in the central western portion along the Kansas line, and in the southeastern and northeastern corners of the State. Fewer chinch bugs were recorded in Kansas, Nebraska, and Iowa than last year. The population in Indiana remained about the same as in 1951.

Should the spring and early summer be warm and dry in those States showing an increase in hibernating chinch bugs, trouble can be expected and controls may be needed. Little or no trouble is expected in the other states except Indiana, where local infestations may do damage.

Announcing...



COMPLETE dispersion for easy mixing and superior dusting qualities

CONSISTENTLY free flowing from all types of dusting equipment

COMPATIBLE with all insecticides now in general use

COVERS more plants and greater area than diluents of lesser density

CONDITIONS insecticides, preventing packing and lumping in storage

COATS plants, leaves and stems with uniform toxic film

Calcium Carbonate Company

222 West Adams Street · Chicago 4, Illinois
PLANT LOCATIONS: Quincy, Illinois · Weeping Water, Nebraska · Carthage, Missouri
LABORATORIES: 520 South Fourth Street, Quincy, Illinois

SUPPLYING INDUSTRY WITH CALCIUM CARBONATE PRODUCTS FOR OVER A QUARTER OF A CENTURY

FTC Postpones Hearing

The trade practice conference on soil conditioners requested by manufacturers has been postponed by the Federal Trade Commission, it has been announced. The FTC indicated that more time will be needed to "permit adequate consideration and appraisal of the results obtained through use of the various products and the conditions and limitations relating to such use."

Since FTC has filed at least one complaint against one producer and is said to be preparing others, the industry had requested a conference for the purpose of forming a set of advertising rules acceptable to both the industry and the government agency.

The FTC is particularly watchful for advertising which gives consumers the impression that remarkably good results can be obtained regardless of what kind of soil the purchaser may desire to treat with the product, and failure to disclose the fact that in order to obtain optimum results, soil must be prepared and in most cases, the product must be mixed with the soil. FTC is also concerned over failure to disclose related facts such as the quantity of the product necessary to be applied to a given area for best results and advertising a product in such a way as to create an erroneous impression that the overall benefits derived from the use of the product are equal to or surpass those of peat moss.

•

Ike Presents USDA Plan

A plan for reorganization of the U. S. Department of Agriculture has been sent to Congress by President Eisenhower who commented that his objectives are to "simplify and make effective the operation of the Department of Agriculture, to place the administration of farm programs close to the state and local levels and to adapt the administration of the programs of the department to regional, state and local conditions."

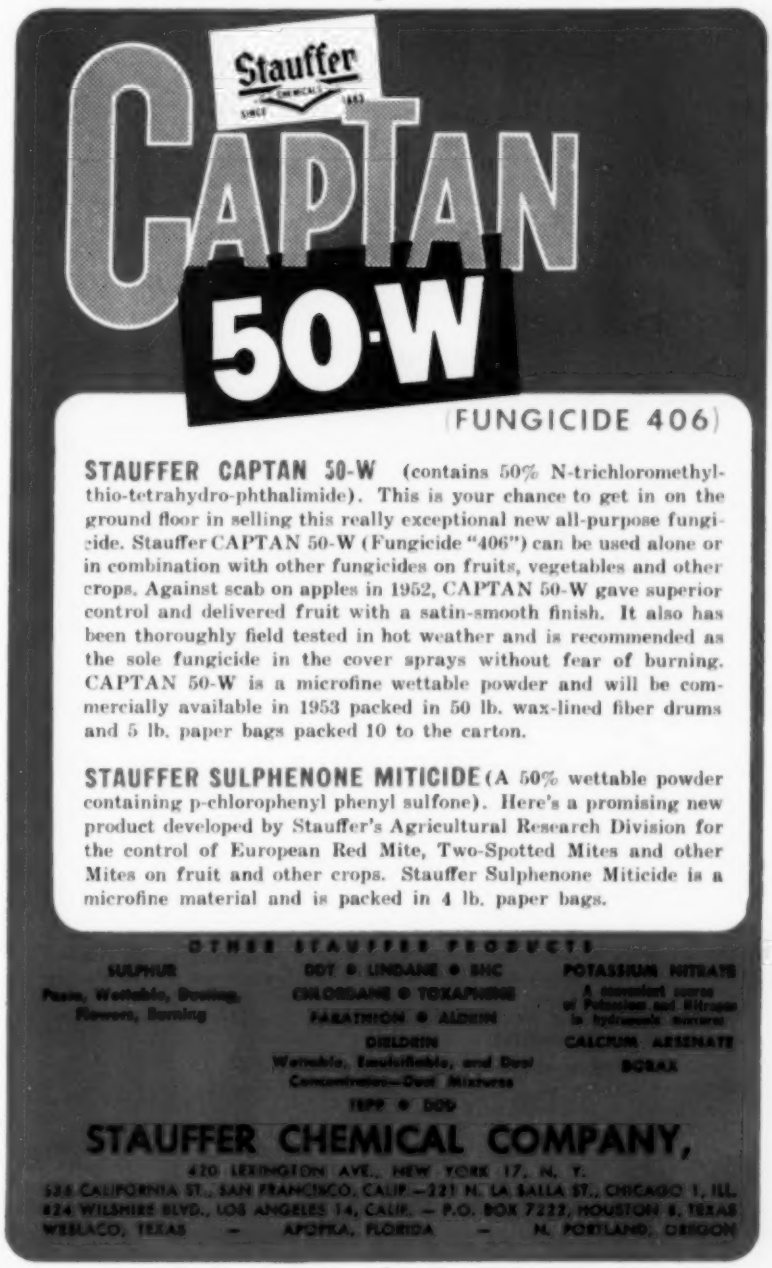
The plan is based primarily on vesting in the Secretary of Agriculture responsibilities now assigned to subordinates. Two additional assistant secretaries, political appointees of the President, and an administrative assistant secretary appointed from civil service by the Secretary (with approval of the President) would be added to the present setup of an Under Secretary and one assistant secretary. These latter two positions would be retained under the proposed plan.

Senator Robert A. Taft, Ohio, said on March 25, that he believed the plan would go through. Reorganization plans go into effect sixty days after submission unless in the meantime Congress votes to put them into effect sooner, or disapproves them by a vote of two-thirds of all the members of either the Senate or the House of Representatives.

•

Big Spraying Project

Forest spraying aircraft which will take part in DDT treatment of more than a million acres of balsam fir in eastern Canada, are expected to leave their bases in half a dozen


Stauffer
CAPTAN
50-W
(FUNGICIDE 406)
STAUFFER CAPTAN 50-W (contains 50% N-trichloromethyl-thio-tetrahydro-phthalimide). This is your chance to get in on the ground floor in selling this really exceptional new all-purpose fungicide. Stauffer CAPTAN 50-W (Fungicide "406") can be used alone or in combination with other fungicides on fruits, vegetables and other crops. Against scab on apples in 1952, CAPTAN 50-W gave superior control and delivered fruit with a satin-smooth finish. It also has been thoroughly field tested in hot weather and is recommended as the sole fungicide in the cover sprays without fear of burning. CAPTAN 50-W is a microfine wettable powder and will be commercially available in 1953 packed in 50 lb. wax-lined fiber drums and 5 lb. paper bags packed 10 to the carton.
STAUFFER SULPHENONE MITICIDE (A 50% wettable powder containing p-chlorophenyl phenyl sulfone). Here's a promising new product developed by Stauffer's Agricultural Research Division for the control of European Red Mite, Two-Spotted Mites and other Mites on fruit and other crops. Stauffer Sulphenone Miticide is a microfine material and is packed in 4 lb. paper bags.
OTHER STAUFFER PRODUCTS
SULPHUR
Paste, Wettable, Dusting, Flowers, Burning
DDT • LINDANE • BHC
CHLORDANE • TOXAPHENE
PARATHION • ALDRIN
DIELDRIN
Wettable, Emulsifiable, and Dust Concentrates—Dust Mixtures
TEPP • DDD
POTASSIUM NITRATE
A convenient source of Potassium and Nitrogen in hydroponic nutrients
CALCIUM ARSENATE
BORAX
STAUFFER CHEMICAL COMPANY,
420 LEXINGTON AVE., NEW YORK 17, N. Y.
636 CALIFORNIA ST., SAN FRANCISCO, CALIF.—221 N. LA SALLE ST., CHICAGO 1, ILL.
624 WILSHIRE BLVD., LOS ANGELES 14, CALIF. — P.O. BOX 7222, HOUSTON 8, TEXAS
WESLACO, TEXAS — APOPKA, FLORIDA — N. PORTLAND, OREGON

Stable dispersions of DDT, BHC, Sulfur . . . in fact any insecticide formulated as a wettable powder . . . are easily obtained by the addition of one to two percent Marasperse. With Marasperse added, spray tank contents are maintained at a uniform concentration. Insecticides are uniformly applied for maximum effectiveness throughout the spraying period.

Because it is a non-hygroscopic and free-flowing powder, Marasperse facilitates grinding and blending operations. It can be stored indefinitely without caking or deteriorating.

The powerful dispersing action of Marasperse is unaffected by the hardest waters. Marasperse enhances the action of wetting agents and permits the use of reduced amounts of these high cost components in formulations. A neutral compound, Marasperse will not affect toxicity of the insecticide.

Write for samples and file number 627 for additional information on Marasperse. Our technical staff will welcome the opportunity to cooperate with you.

MARATHON CORPORATION
CHEMICAL DIVISION
ROTHSCHILD • WISCONSIN

western and southern states early in May.

A. L. Baxter, president of Central Aircraft, Inc., Yakima, Washington, said his firm's forest sprayers would start the long ferry flight—about 3,400 miles—near May 1. Central will furnish between 55 and 60 airplanes for the job. The huge project will use a total of seventy-five 450 h.p. Stearman biplanes.

Prime contractor for the project is a Canadian aircraft firm, Wheeler Airlines, Ltd., of Ste. Jovite, Quebec. Approximately 15 of the aircraft on the project will be Canadian.

Mr. Baxter said his firm is assembling its part of the fleet from Texas, Arizona, Louisiana, California, Oregon and Washington.

Project area is in northern New Brunswick, where spruce budworm is threatening a large and valuable stand of pulp wood. The spraying operation—largest ever tried in Canada and possibly the largest in the world—is being financed jointly by the Dominion government, the Province of New Brunswick, and a group of private timber and pulp firms.

Last year, in the Upsalquitch area of New Brunswick, 200,000 acres of balsam fir were sprayed to kill budworms, as a "pilot" project. Central Aircraft furnished most of the planes for that job. The 1952 spraying was a marked success, with a reported kill of "more than 99 percent."

PLANT FOOD COUNCIL

(*Continued from Page 55*)

Members of the Council's executive and convention committees are: chairman, James F. Doetsch, president, Chilean Nitrate Sales Corporation; John V. Collis, president, Federal Chemical Company; George W. Gage, president & general manager, Anderson Fertilizer Company, Inc.; C. B. Robertson, president, Robertson Chemical Corporation; W. T. Wright, vice-president, F. S. Royster Guano Company; and George E. Petitt, vice-president, Potash Company of America (ex officio.)

AS WE GO TO PRESS . . .

Grace Chemical Plans $19 Million Plant

PLANS for the construction of a new $19 million nitrogen plant near Memphis, Tenn., have been announced by William P. Gage, president of Grace Chemical Co., wholly-owned subsidiary of W. R. Grace & Co. Mr. Gage indicated at a press conference March 25, that the new plant would produce some 250 tons of ammonia per day when it is completed in the summer of 1954.

The plant will employ an air separation plant designed by Air Products Incorporated to furnish pure oxygen and nitrogen; the Texaco Partial Oxidation Process for the manufacture of synthesis gas; the Casale Ammonia Process for the production of ammonia; and the Pechiney Process for the manufacture of urea by use of by-product carbon dioxide and ammonia from the Casale unit. Nitrogen produced in the form of ammonia and urea at the Grace Chemical plant will be used for both agricultural and industrial uses.

Mr. Gage came with Grace Chemical Company, wholly- owned subsidiary of W. R. Grace & Co., early in 1953 as president and a director of the company. He formerly was vice-president in charge of manufacturing of the Shell Chemical Corporation, a position to which he was named in 1941.

John Carriere, former manager of the engineering and construction division of the Hanford Works of the Atomic Energy Commission's program, is plant manager. Controller of Grace Chemical Company is Harold S. King, formerly associated with Commonwealth Services Inc. and Price Waterhouse & Co. C. J. Bown has been named manager of sales development and E. E. Winne, an assistant V.-P., is in charge of the company's development department.

WM. P. GAGE

Below: Architect's drawing of new plant.

Fertilizer Use Abroad

Both fertilizer production and consumption in various countries have been on the increase, reports from abroad say. Egypt, Austria, Spain, India and Germany are reported to be increasing their fertilizer industries, while France is lagging in its use of plant nutrients.

The Austrian Nitrogen Works produced 462,322 metric tons of nitrogenous fertilizers in 1952, compared to 436,000 tons the previous year, it is reported. Domestic consumption jumped from 102,900 tons in 1951 to 128,750 tons last year, while production of ammonium sulfate, begun in 1952, amounted to 32,000 tons by December 31.

Consumption of fertilizer materials in western Germany during 1952 was also larger than during the previous year. Nitogenous plant food consumption totaled 386,000 metric tons, as compared to 362,000 the previous year; phosphatic plant food, 469,000 tons against 418,000 tons the year before; and potash, 723,000 against 659,000.

Egypt plans to establish a triple superphosphate industry, it is reported. The government indicates it would welcome participation by U. S. firms. (Information is available from Brig. Gen. Hassan F. Ragab, Under-Secretary of State, Ministry of War and Marine, Cairo, Egypt.)

Daily output of ammonium sulfate is expected to be increased from 50 metric tons per day to 500 at two Spanish fertilizer plants. The two, located at La Felguera, Oviedo, Spain, are owned by Sociedad Iberica del Nitrogeno. The company is in process of expansion.

India, too, is taking steps to increase consumption of ammonium sulfate during 1953. Farmers will receive fertilizer materials on a deferred payment basis and may repay with grain at fixed prices. Growers of food grains will be extended credit for the purchase of fertilizers, except those on unirrigated land where uncertain rainfall is the rule. Commercial crops such as tea and sugarcane are not included in the fertilizer loans.

Let's Cut the Malarkey!

LIKE I say, we're a bunch of easy going blokes, and it takes us a while to get riled up.

First we hear about this new American Chemical Society mag is when some one tips us they have practically grabbed our name. We been AGRICULTURAL CHEMICALS for some years, and now with a modest show of imagination these new folks are going to be AGRICULTURAL CHEMISTRY . . . with an "and Food" slipped in to further identify the broader field they're going to cover. "A little too close for comfort," we figure, but then they switch to calling the new job the JOURNAL of AGRICULTURAL and FOOD CHEMISTRY, so we calm down.

Next we see a copy of their circulation breakdown for the first issue, and oddly enough their ag chemical group for this never-before-duplicated publication matches our circulation so closely as to be something more, perhaps, than just a remarkable coincidence. But still, we figure, "they may have their reasons. It's a free country, competition is the life of trade and all that" . . . and we don't get mad.

We don't even feel surprised when we hear that they're going to send the first issues free, willy nilly, here and there, whether you're a member of the ACS or not, and the good old ACS will foot the bill. And we don't even get much worked up when we hear stories about 25 copies free with a quarter page ad, and fifty free with a half, and so on, like a free deal on soap.

Then we hear, by jeepers, that one of their columns is going to be tabbed "The Observation Post". Oddly enough, since our first issue seven years back, we been tossing off some gems each month under the sign, "The Listening Post". But still we don't get mad, though we do figure that with all that bunch of editors, gazing into crystal balls and such, they might at least be able to figure out an original name for a column.

We don't even get much agitated when they follow our lead by naming an editorial advisory committee, an even bigger one of course than we have. But, after all, we figure, "we didn't invent the idea of an editorial advisory committee either." And even when they start asking our members to serve on their committee too, we say nothing.

What finally moves us out of our editorial calm, we suppose, is the famous cocktail party which launches the more commercial aspects of their new book. Here's a magazine "devoted to the applications of chemistry to the growing of agricultural and food products." Here is a new publication that will give "the scientist, chemist, chemical engineer, entomologist and nutritionist a modern, up-to-date look at the latest developments in agricultural and food chemistry" . . . But do they invite these scientists and chemists and nutritionists and so on to their cocktail party, with test tubes sticking out of their smocks?

Not the way we heard it. A spirit of crass materialism creeps in, — and the free hootch and pep talks was ladled out to a bunch of ad prospects and ad agency boys. We begin to wonder. "Have we got this new mag all wrong? Is the old, respectable ACS maybe just in this thing to make a buck, . . . and what has happened to science?"

Then when the barrage of publicity begins to hit all around, we start to burn a bit. Even we begin to get the press releases. All about how this one and that one has been after the ACS to start this new publication. "Cut the malarkey", we observe, for confidentially, friends, no one is much on urging you to start a new magazine . . . . normally you think up the idea yourself.

And all about how there has long been a glaring lack of a publication like the ACS is going to get out. And nobody ever did it like they're going to do it. And all about how there is no mag today serving this field. "Cut the malarkey", we repeat. "There ain't *one*, friends, there's *seven*." And most of them doing a pretty darn good job of it too, all of them presumably making enough dough to pay taxes.

And then, since we've brought the subject up, we get thinking about taxes. Maybe it was around March 15th. And we start thinking how we pay taxes, and this one pays taxes, and that one pays taxes, and most everybody pays taxes . . . But the ACS, we hear, don't pay taxes!

Of course, we figure, maybe they shouldn't pay taxes. They're aiding science, and serving industry and agriculture, and a tax exempt charter would be OKay.

But then, we give it another good think, and we remember they're competing with us . . . and we pay taxes! And they're competing with these other legitimate commercial trade paper boys . . . who pay taxes too!

And we begin to think that if the ACS is going to push farther and farther . . . into this field and that . . . with its publishing business, and drain off more and more of the dough out of advertising budgets, maybe they ought to divorce their publishing business, with its necessarily commercial taint, and its cocktail parties and commissions and such, from the purely scientific chores of running a "chemical" society. After all they're not a publishing society.

Well, it's just an idea, and we don't fancy they'll ever do it. But if the publishing end of the business would take off the scientific false face and admit they're legitimately commercial, it would be refreshing. And even if they didn't come down off the ivory throne and start paying taxes like other publishers, if they would just cut the malarkey about there being no other publication that has ever tried to do the job they're trying to do, that would be something, wouldn't it?

Agricultural Chemicals

NATIONAL FERTILIZER ASSOCIATION

To White Sulphur Springs June 15-17

DISTINGUISHED agricultural, industrial and governmental leaders will participate in the 28th annual convention of The National Fertilizer Association at the Greenbrier Hotel, White Sulphur Springs, West Virginia, June 15-17. Advance registration is reported to be the heaviest on record.

"Efficient Water Utilization" will be the topic discussed by a panel at an open meeting of NFA's Plant Food Research Committee on the morning of June 15. Participants will be W. B. Camp of W. B. Camp & Sons, Inc., Bakersfield, California; R. Q. Parks, Division of Soil Management and Irrigation, BPISAE, U. S. Department of Agriculture, Beltsville, Md.; James Ferguson, Memphis, Tennessee, who will speak for the Sprinkler Irrigation Association, Washington, D. C.; and H. H. Tucker, director, Coke Oven Ammonia Research Bureau, Columbus, Ohio, and chairman of the committee, who will preside. A meeting of NFA's board of directors will be held the same morning.

Addressing the first general session, June 16, will be Hugh M. Comer, president, Avondale Mills, Sylacauga, Alabama; Hon. True D. Morse, Under-Secretary of Agriculture, Washington, D. C.; and Louis Ware, president, International Minerals & Chemical Corporation, Chicago, Illinois, who will speak as chairman of the Association's board of directors.

Hon. TRUE D. MORSE

Leading off at the second general session, June 17, will be Russell Coleman, NFA's president, followed by a panel discussing "Proper Use of More Fertilizer." With Roy Battles, assistant to the master, The National Grange, as moderator, the following will take part: Milton C. Cummings, president, Farmers and Merchants Bank, Effingham, Kansas, representing the credit agencies; Werner L. Nelson, in charge, Soil Fertility Research, School of Agriculture, North Carolina State College, representing the Land Grant Colleges; Frank W. Parker, Director of Soils Research, BPISAE, U. S. Department of Agriculture; and W. F. Price, Plant Food Division, Swift & Company, Chicago, Illinois, speaking for the fertilizer industry.

(Below)
FRANK W. PARKER

The customary recreational and social events, including the annual banquet and Festival Night on June 16, will round out the program.

WERNER L. NELSON

N. J. Weed Conference

A weed control conference was scheduled to be held at Rutgers University, New Brunswick, N. J., April 8 & 9, featuring papers on chemical weed control both in agricultural and urban areas.

Speakers listed on the first day's program included representatives of the N. J. Department of Health; and New York University's medical school.

Robert Frans, research assistant in the Farm Crops Department, Rutgers, was to tell how to identify weeds such as poison ivy, ragweed and marijuana, and describe chemicals for control.

Dr. Richard Aldrich, U. S. Dept. of Agriculture, New Brunswick, was to discuss development of new herbicides, and with John Baylor, Rutgers specialist in farm crops, planned to give a demonstration of equipment and technique.

Questions of legislation, policy regarding private property, public relations and coordination were to be handled by a panel comprising Dennis Sullivan, health officer, Jersey City, N. J.; Maurice Bowen, shade tree commissioner, Teaneck, N. J.; Robert D. Murrill, sanitarian, U. S. Public Health Service and Carl Wendel, health officer, Maplewood, N. J.

Forms Vermiculite Firm

Establishment of the Southeastern Vermiculite Company has been announced by Macon Brick & Block Co., Macon, Ga. The new company will be a division of the Macon concern.

Southeastern Vermiculite Co. will operate as a licensed associated plant of American Vermiculite Corp. featuring "American Brand Vermiculite" nuggets in all grades as well as other proprietary products mixed and manufactured by the firm.

American brand fertilizer conditioner and other types of product will be packed in individually colored four-cubic-foot bags. Horticultural grades, to be sold under the trade name of "Glitter," will be available in various sized bags for consumer and housewife as well as professional growers, the company says.

Inquiries regarding the new company should be addressed to Theron A. Holmes, president, Macon Brick & Block Co., Macon, Ga.

Southern Fertilizer Safety Section Meets

BELOW are additional pictures of the fertilizer safety meeting held in Atlanta, Ga., March 2 & 3, in connection with the Southern Safety Council. The meeting, reported fully in our March issue, was attended by representatives of the fertilizer industry of Georgia and other surrounding states.

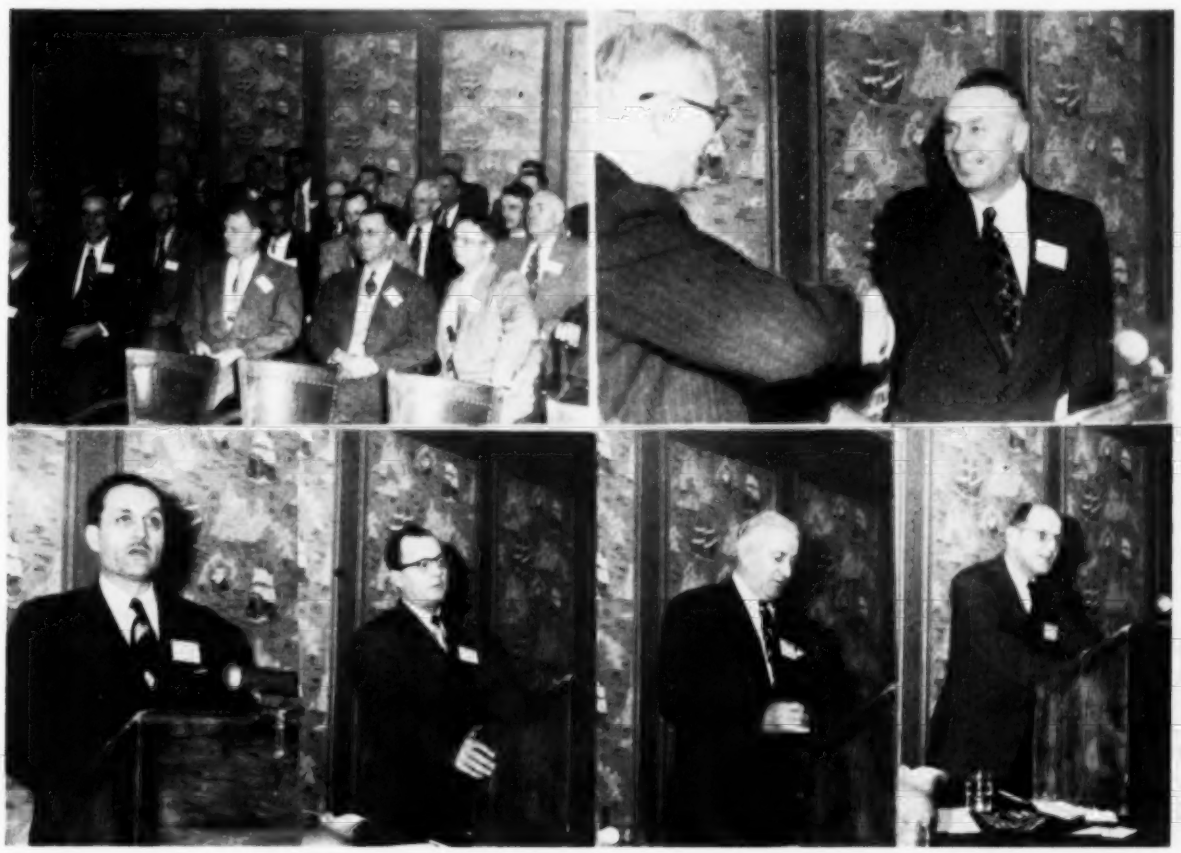
In the top photo (left) part of the crowd is seen attending the second day's session. At the right, Vernon S. Gornto, retiring chairman of the southern fertilizer section congratulates his successor, Mike Ellison, Mississippi Chemical Co., Yazoo City, Miss.

Below are three of the speakers appearing on the program, with Mr. Gornto who acted as chairman. They are, (left to right): A. C. Thornton, industrial relations manager, International Minerals & Chemical Corp., Chicago, Ill. He talked on "Before and After," presenting an over-all view of IMC's safety program and its beneficial results.

Second photo is O. R. Kiphart, safety supervisor, Phillips Chemical Co., Borger, Texas. His topic was "The Maintenance Foreman's Responsibility," showing how the safety movement must work through this level to be successful.

Third photo is Mr. Gornto again and the last is that of Walter Zielenske, fire prevention engineer, Marsh & McLennan, Chicago. His topic was "The Importance of Fire Prevention."

All photos by *Agricultural Chemicals*.



ONE SPRAYING KILLS WEEDS AND GRASS IN FLAX

DOW weed and grass killers combine for single-operation control

Good weed and grass control in portion of flax field treated with Dow MCP Amine Weed Killer and Dow Sodium TCA 90%.

Dow MCP Amine Weed Killer, introduced last season, gives good weed control in flax and certain other legumes and small grains. Adaptable to both high and low volume spraying in hard or soft water, this new highly selective weed killer controls mustard, ragweed, lambs'-quarters and other common annual weeds in 2,4-D sensitive crops.

Dow Sodium TCA 90% can be used with Dow MCP Amine Weed Killer for over-all weed and grass control in *one* application on flax. This combination spray controls seedling grasses (except wild oats) as well as broad-leaved weeds.

Dow sales and technical men are available to work with persons responsible for recommending agricultural chemicals. Call the nearest Dow sales office listed in your telephone directory or write to Midland. Literature is available on both products. THE DOW CHEMICAL COMPANY, *Agricultural Chemical Department*, Midland, Michigan. In Canada: Dow Chemical of Canada, Limited, Toronto, Canada.

you can depend on DOW AGRICULTURAL CHEMICALS

DOW

Elsas Named Ass'n Head

Clarence E. Elsas, president of Fulton Bag & Cotton Mills in Atlanta, was elected national president of the Textile Bag Manufacturers Association at the quarterly meeting held recently in Houston. Richard K. Peek of the Percy Kent Bag Company in Kansas City and Buffalo was elected vice-president.

Mr. Elsas is a grandson of Jacob Elsas, founder of Fulton Bag, and has been active in the textile industry since joining the company sales staff in New York in 1926. He spent some time in the sales department of the Minneapolis plant before continuing his work in sales and advertising at the New Orleans branch. In 1938 he entered the executive offices in Atlanta as vice-president—an office he held until his election to the presidency in 1950.

•

Diamond Names Division

Diamond Alkali Company has announced that the name of its subsidiary, Kolker Chemical Works, Inc., a New Jersey Corporation, has been changed to "Diamond Alkali Organic Chemicals Division, Inc."

Diamond purchased the Kolker concern in August of 1951 as part of its expansion program in the organic chemicals field. The subsidiary has plants at Newark, N.J., and Houston, Tex., which manufacture a wide range of organic chemicals for agriculture and industry.

•

Enters Ag. Chem. Field

Universal Match Corporation, St. Louis, Missouri, has announced recently a new sales division to market agricultural chemicals. Named the "Planetary Chemical Division," this branch will be under the direction of Robert G. Hayward, Jr., sales manager.

The agricultural chemicals will be manufactured by Planetary Chemical Company, Inc., Creve Coeur, Missouri. First organized in 1944, this company produces emulsifiers, insecticides, herbicides, fungicides, rodenticides and wood preservatives. The company plans an intensive program of development and growth with emphasis on both bulk and packaged quantities of its products for national distribution by the Planetary Chemical Division of Universal Match.

Mr. Hayward has held previous positions with Ultra-Life Laboratories, East St. Louis, Ill. and the organic and Phosphate Divisions of Monsanto Chemical Company in St. Louis, Mo.

•

Hercules Announces Granular Toxaphene

A new granular form of toxaphene, composed of grains approximately the size of clover seed, has been produced by Hercules Powder Company, Wilmington, Del. The new form appears promising for control of soil-infesting insects.

Work conducted at the South Carolina Agricultural Experiment Station at Clemson indicates that granular toxaphene is effective in reducing crop losses from soil insects if the material is worked into the soil. When applied to crops such as corn or sorghum, the granules do not cling to foliage but fall into the whorls where budworms and armyworms feed, or onto the soil at the base of the plant to control cutworms, chinch bugs and non-climbing insect pests.

Plant Food in Attractive Packages

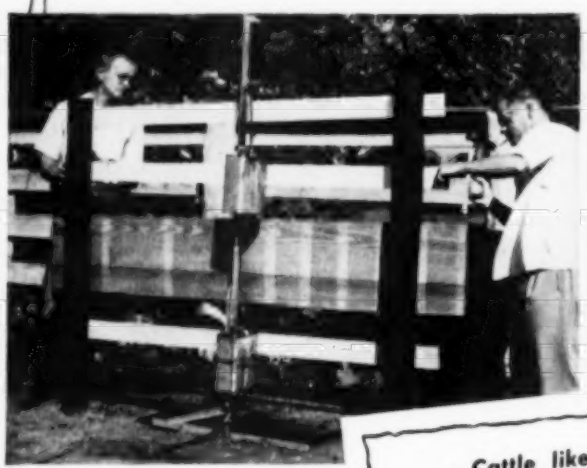
Packed in a new display package manufactured by The Hinde & Dauch Paper Company, Sandusky, Ohio, the above box contains packages of rooting medium, potting mixture, plant food, and spray for growing African Violets. Interior partitions separate each individual item and hold it securely for effective display and protection in shipment.

Attractively printed in green and lavender on white corrugated board, the box is quickly set up for display on retail counters. A die-cut riser display panel thus formed prominently displays the brand name, selling message, and a full color illustration of an African Violet plant in bloom.

Merchandising related items in a single package like this is favored by the retailer because it needs no repacking and has a high after-purchase use in the customer's home since it serves as a convenient storage kit for the flower-growing products.

NOW THE CATTLE SPRAY (and sell) THEMSELVES

...in the Automatic Sprayer



(Photos by Illinois Natural History Survey)

> ...Cattle like the idea so much that they spray themselves more than they need to...
> **(From Progressive Farmer —Sept. 1952)**

Developed by the Illinois Natural History Survey, the automatic sprayer technique is one of the fastest growing developments in the insecticide industry. Hundreds of sprayers have been installed from coast to coast, and the response from farmers indicates they like the convenience and effectiveness of this method.

It costs only 1 to 1½ cents per treatment to spray cattle in the automatic sprayer with Pyrenone spray. And Pyrenone is the spray for this technique because it presents no toxic hazards, yet gives quick knockdown and kill, effectiveness on a wide range of insects and economical results.

Here is another sales opportunity for your Sprays based on

Pyrenone*

*Reg. U. S. Pat. Off.

U.S.I

USTRIAL CHEMICALS CO.

Division of National Distillers Products Corporation

120 Broadway, New York 5, N. Y. *Branches in all principal cities.*

In Canada: Natural Products Corporation, Montreal, Toronto and Vancouver.

DuPont Markets "FTE"

"Ferro FTE," a slowly soluble soil mineralizer, will be made available to the home gardener in one pound and five pound packages by E. I. Du Pont de Nemours and Company, Inc. this spring. The product, a new development of the Ferro Corporation of Cleveland, was found to increase crop yields by as much as 40% during a five-year research program. A one pound package of FTE, costing approximately $1.00, is enough to treat 400 square feet, the company says. The five-pound bag retails for approximately $2.95, at garden supply stores and outlets where Du Pont garden products are sold.

•

New Stauffer Product

A new chemical fertilizer product containing ammoniacal nitrogen and phosphorus, will be manufactured by the Stauffer Chemical Co. at Tacoma, Washington, it has been announced. Wilson & Geo. Meyer & Co. will distribute the material. The plant, now under construction, is next to Stauffer's single superphosphate plant at Tacoma.

The fertilizer is made by a process developed and patented by Rumianca, Societa per Azioni of Turin, Italy, and licensed exclusively in the U. S. to Stauffer. It will be offered to other U. S. producers under sub-license.

The process can be varied to produce a granulated material containing between 5% and 10% of nitrogen and 10% to 15% of phosphoric acid, but the exact composition of material to be produced at Tacoma will depend on the results of a market survey now under way. Stauffer states that about 90% of the available phosphoric acid in the new product will be water-soluble. This is approximately the same percentage of water soluble phosphoric acid as in single superphosphate. In other words, the makers point out, there is no reduction in the water soluble P_2O_5 content as occurs when single superphosphate is ammoniated.

Completion of the plant is scheduled for late in 1953.

•

Pacific ESA Program

A program covering many phases of entomology has been announced for the Pacific Branch of the Entomological Society of America, by Dr. Ray F. Smith, program chairman. The meeting, to be held June 23, 24, and 25 at Connolly's Hotel at the south end of Lake Tahoe, California, will be the first annual summer meeting of the group since the recent amalgamation of the American Association of Economic Entomologists with the former Entomological Society of America.

According to Dr. Smith, invitational papers, symposia and panel discussions will be presented on these topics:

Entomological activities of the Pacific Science Board; development and evolution of a new insecticide; cooperation between research workers, the Extension Service, and industry; recent developments in the control of forest pests in Western United States and Canada; highlights in the development of entomology in the Pacific Branch Territory; control of ectoparasites of livestock; and absorption and translocation of insecticides in plants.

An evening meeting devoted to the problems of extension entomology is being planned. Submitted papers from members of the branch will also be included on the program. (Papers from any member on any phase of entomology are welcomed, but abstracts and titles should be sent in by May 1, 1953 to Dr. Ray F. Smith, program chairman, 112 Agriculture Hall, University of California, Berkeley 4, California.) Movies on entomological subjects will be shown concurrently with the general session.

Chairman R. W. Underhill of the arrangements committee is preparing a program for the ladies which is expected to include a boat trip around Lake Tahoe with a stop off at several interesting spots and a bus trip to Virginia City, Nev.

Officers of the Pacific Branch include Dr. Stanley F. Bailey, chairman; A. W. Lindquist, vice-chairman and Dr. Leslie M. Smith, secretary-treasurer. The Pacific Branch now has a membership of 950, largest of any of the five branches of the ESA.

•

Cyanamid Appoints Two

Appointments to two key positions at American Cyanamid Company's nitrogen chemicals plant under construction near New Orleans, Louisiana, have been announced by G. J. Forney, plant manager. Dr. N. H. Marsh and Dr. F. W. Mitchell, Jr. were named chief chemist and chief analyst, respectively

Dr. Marsh, who joined Cyanamid in 1945, served as a group leader in the Research Division and later as coordinator of a special project at the company's Stamford research laboratories, Stamford, Connecticut, prior to his new appointment. He was graduated from Rice Institute with a B.A. in 1938, an M.A. in 1940 and a Ph.D. in 1942, all in chemistry.

Dr. Mitchell came to Cyanamid from General Aniline & Film Corporation, Easton, Pennsylvania, where he was a senior research chemist. In 1938 he received an A.B. in chemistry from the University of Alabama. Later he earned his M.S. and Ph.D. degrees in organic chemistry at the California Institute of Technology.

•

Sharples Names Greenlaw

Appointment of Allen R. Greenlaw as general sales manager has been announced by Sharples Chemical Co., Philadelphia. He has been associated with the firm in different sales capacities in New York, Houston and Philadelphia.

More Books....

Insect Resistance in Crop Plants

by Dr. Reginald H. Painter

520 pages, price $9.80

Here is a complete analysis of the relationship between crops and phytophagous insects together with a full analysis of the insect resistant varieties of important crops, such as wheat, corn, cotton, sorghums, potato.

Soils and Fertilizers

by F. E. Bear

375 pages, price $4.50

This text presents the basic scientific facts and principles behind the production and utilization of agricultural chemicals. The why, when, where and how of fertilizers is expressly discussed, with particular emphasis on the importance of lime and fertilizer materials in maintaining and increasing the productivity of soils.

Weed Control

by W. W. Robbins, A. C. Crafts, and R. N. Raynor

543 pages, price $6.00

Here is an authoritative, thorough book that gives you all the data and practical help you need to prepare—and carry out — a tested, efficient, successful method of attack on any weed in any location quickly and effectively. Based on experience, research and experiment, it shows what methods of weed control have proved most effective for weeds of all species — from crab grass to wild mustard — points out what methods can be applied economically in certain areas — shows how and when to apply a control measure, the season and rate of application, dosage, etc., and outlines the materials and machinery needed.

Chemistry and Uses of Insecticides

by E. R. de Ong

445 pages, price $6.75

Written by an outstanding student of entomology and agricultural technology, this book covers all the major insecticidal agents in detail, describing not only their chemical nature and properties, but also their specific action on various types of insects, their methods of application, and their effect on animals and humans.

Soils and Soil Fertility

by L. M. Thompson

330 pages, price $5.00

This authoritative treatment begins by telling what soil is — what makes it up physically, chemically, biologically —and what its moisture-holding characteristics are. The use of commercial fertilizers and farm manure are other subjects under discussion.

Agricultural Chemicals
175 Fifth Ave., New York 10, N. Y.

Enclosed is payment. Please send the books checked.

- ☐ Insect Resistance in Crop Plants—$9.80
- ☐ Weed Control—$6.00
- ☐ Soils and Fertilizers—$4.50
- ☐ Chemistry and Uses of Insecticides—$6.75
- ☐ Soils and Soil Fertility—$5.00

(Add 3% sales tax in New York City)

Name .....

Street .....

City, Zone, and State .....

Order direct from

Agricultural Chemicals

175 Fifth Ave.

New York 10, N. Y.

WASHINGTON NOTES

(*Continued from Page 46*)

tion year ending June, 1953. This prediction is made by Louis Wilson of the American Plant Food Council, who points out that this would be the fifteenth consecutive year in which such a gain over the previous year has been registered.

* * *

Corroborating figures come from John Gale of the National Fertilizer Association. According to his preliminary estimates for the calendar year 1952 (as differentiated from the crop year ending June, 1953), consumption of fertilizer totaled 20,050,000 tons. This compares with 18,800,000 tons for 1951. The gain is slightly over 6 per cent. New England states continue to show a down trend, while a good gain is reported for the east north central group. If these figures are confirmed, Ohio and Indiana will become the first two states outside the deep South to go over the one million ton mark in fertilizer consumption.

* * *

Legislative activity at the state level seems to have dropped off in recent weks. Some state legislatures have now adjourned and from the others which are still in session, the crop of late new bills has not been too bad. They are primarily "fee bills" designed to raise, by various licensing provisions, the money to pay for government supervision of the use of agricultural chemical products. When such fees are excessive, they are naturally opposed by the industry. Further extension of the idea of charging for licenses to sell or to use chemical aids to agriculture simply puts an additional burden on the farmer who has the prime responsibility for guaranteeing our food supply. We have the unusual spectacle of the government, on one hand, aiding the farmer in every way possible to produce the food and fibre which the country so urgently needs, while on the other hand, it is unnecessarily taxing some of the most important tools which he must use.

MEETING CALENDAR

Kentucky Green Pastures Spring Tour. May 5-7. (Starting place Frank Hardin farm. U. S. 23, 12 mi. N. of Greenup, Ky., 9:30 a.m.)

First Annual Fertilizer Conference, California Fertilizer Association, Hotel Marysville, Marysville, Calif., May 7 & 8.

Fertilizer Safety Conference, in connection with Virginia State Safety Meeting, Roanoke Hotel, Roanoke, Va., May 7 & 8.

Maryland Fertilizer Safety Conference in connection with Governor's Safety, Health Conference & Exhibit, Lord Baltimore Hotel, Baltimore, Md., May 8, 1953.

North Carolina Fertilizer Safety Conference, Robert E. Lee Hotel, Winston Salem, N. C., May 14 & 15.

Chemical Specialties Manufacturer's Association, midyear meeting, Drake Hotel, Chicago, Ill., May 17-19.

American Plant Food Council, The Homestead, Hot Springs, Va., June 11-14.

National Fertilizer Association, Greenbrier Hotel, White Sulphur Springs, W. Va., June 15-17, 1953.

Pacific Division, American Phytopathological Society, in connection with meeting of American Association for the Advancement of Science, Santa Barbara, California, June 17-19.

Southern Feed & Fertilizer Control Officials, Clemson, S. C., June 22 & 23

Pacific Branch, Entomological Society of America, June 23-25, Connolly's Hotel, Lake Tahoe, Calif.

South Carolina Fertilizer Meeting, Pee Dee Experiment Station, Florence, S. C., July 16, 1953.

Twentieth Annual Fall Meeting, National Agricultural Chemicals Association, Essex and Sussex Hotel, Spring Lake, N. J., September 9, 10 & 11.

Thirtieth Annual Convention, California Fertilizer Association, Carmel-By-The-Sea, Calif., November 9 & 10.

Maryland Safety Meeting

The Maryland Fertilizer Safety Conference will be held at the Lord Baltimore Hotel, Baltimore, Md., May 8, it has been announced by A. B. Pettit, Davison Chemical Corp., chairman. The meeting will be held in connection with the Governor's Safety Health Conference & Exhibit which begins May 7.

Speakers slated to appear on the program, beginning at 9:30 a.m., are E. O. Burroughs, Jr., F. S. Royster Guano Co., Norfolk, Va., who will discuss "Housekeeping in Fertilizer Plants"; and a panel to discuss fertilizer safety.

Panel members will be F. Wayne High, manager of operations, Baugh Chemical Company, Baltimore; E. F. Carnell, superintendent, Davison Chemical Corp., Savannah, Ga.; Donald Allen, superintendent, Virginia-Carolina Chemical Co., Portsmouth, Va.; and George F. Dietz, safety director, Fertilizer Manufacturing Cooperative, Baltimore, Md.

The afternoon session will start at 2 o'clock, with Mr. Pettit as chairman, and John S. Roszel, manager, industrial relations, Mathieson Chemical Corp., Baltimore as vice-chairman.

"The Safety Program From a Worker's Viewpoint" will be discussed by Bernard T. Hartlove, president of Local 12138, UMWA, Mathieson Chemical Corp., Baltimore. A discussion period will follow, with the same panel participating in the question-and-answer session.

Mr. Pettit has requested that specific safety and fire protection questions be submitted to him by April 27, by those who expect to attend the meeting. He should be addressed as follows: A. B. Pettit, supervisor, Industrial Health and Safety, Davison Chemical Corporation, Baltimore 3, Md.

EDITORIAL

(*Continued from Page 29*)

Thus, we think that Mr. Miller has a good point in proposing

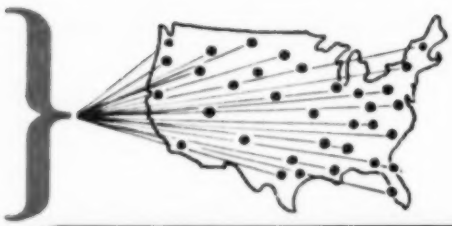
A NEW AND TRULY REVOLUTIONARY

CONDITIONER

NOW Available the Year Around!

Before You Contract for Your Conditioner Needs, Investigate Terra-Lite* Brand Vermiculite

Insure Your Production Schedule!
Eliminate Costly Shipping Delays!
Prompt Delivery from Any One of 36 Plants Across the Nation



Across the country manufacturers are turning to Terra-Lite brand vermiculite Conditioner to help solve their production problems, for with this free-flowing mineral, manufacturers can suit *their own schedule of deliveries,* month by month, to meet *their* needs throughout the year. Your production schedule can be maintained, if you use TERRA-LITE, for it is delivered promptly from a plant near you, at uniform high quality and a stable price!

Terra-Lite Conditioner is a mineral conditioner processed specifically for conditioning your fertilizer. It is not a waste or by-product.

Terra-Lite Conditioner is highly absorbent and contributes maximum flowability to the fertilizer, thus helping to eliminate caking. In addition Terra-Lite is absolutely fireproof, eliminating extra fire hazards in the plant.

Before you contract for next season's conditioner requirement, be sure you have all the facts about Terra-Lite brand vermiculite Conditioner. Send coupon below for free literature, or call, write or wire

Terra-Lite Division of
ZONOLITE COMPANY
135 S. LaSalle St., Chicago 3, Illinois
** Terra-Lite is a registered trade mark.*

ATTENTION INSECTICIDE MANUFACTURERS

Insecticide Grades of Terra-Lite are now being used by leading manufacturers as a carrier for active chemicals. Available in granular or dust form. Ranks high in flowability and absorptive qualities. Incombustible. No grinding problems.

WRITE FOR FULL DETAILS

WRITE TODAY

Terra-Lite Division, Dept. AC-43
ZONOLITE COMPANY
135 S. LaSalle St., Chicago 3, Illinois

Please send me at once, free information on Terra-Lite for ☐ Conditioner ☐ for Pesticide use.

Name.....

Address.....

City.....*Zone*....*State*.....

Terra-Lite
Division of
ZONOLITE COMPANY
135 S. LaSalle Street
Chicago 3, Illinois

to divide the present Federal Food, Drug and Cosmetic Act into three separate sections: food, pesticides and cosmetics. In a statement to the press in March, the bill's author indicated that "the pesticide section amendment should be offered first so it can be used as a model for the other two."

Rep. Miller observes that the present Act is "quite hazy and cumbersome." As he says, "It does not protect the health of the people as it was designed to do, but places a millstone around the neck of industry, whether it be the farmer or the manufacturer." He reports further that he has held "numerous conferences with representatives of the Food and Drug Administration, the chemical industry and the manufacturing industry." It is out of these conferences that the present bill has evolved, he says.

We have stated many times before that the present setup under F.D.A. would be adequate to protect the health and well-being of the public if only its provisions for enforcement were adhered to. The machinery is available.

If new legislation is to be passed, as seems inevitable, the new Miller proposal appears to be the most acceptable both to the industry and to others who have a like interest in maintaining the nation's good health.

If Congress is to consider new legislation, we urge its members to consider closely the provisions of H.R. 4277.

N. CENTRAL ESA

(Continued from Page 44)

J. C. Frankenfeld, Orkin, Exterminating Co., Atlanta, in discussing fumigants in contrast to residual insecticides in stored grain, indicated that "fumigants are rapid in action, but leave no protecting factor to prevent further reinfestation." He reported further, that although fumigants are less costly per application, over a long range it might prove more economical to use residual insecticides. Dr. Frankenfeld reported however, that fumigation is advisable for some types of commercial storage, grain in transit, and other storage of grain.

Studies of several new organic insecticides as grain fumigants were presented by N. Dennis, USDA, BEPQ, Manhattan, Kansas. The results of tests with methyl thiocyanate, oil of mustard, ethyl acetate, ethyl formate, methyl formate, dichlorodimethyl ether and 1,1 dichloro 1-nitroethane were reported in general. In a discussion of the subject, J. C. Dawson, of J. C. Dawson & Assoc., St. Louis, indicated that better results were obtained in space fumigation using both methyl bromide and ethyl dibromide, than by using either alone, indicating synergism.

The question of systemic insecticides was undertaken in two specific reports respectively by B. N. Smallman, Scientific Service Labs., Canadian Dept. of Agriculture, London, Ontario, and J. M. Magner, Monsanto Chemical Co., St. Louis. Dr. Smallman indicated that the most useful compounds were those formulated with schradan. Among the requirements of a systemic, he continued, are; water solubility, so that the compound can penetrate the plant cuticle and leaf; and freedom from toxic hazard. It was observed that TEPP breaks down in water, and therefore is not a systemic. Among the advantages of systemic insecticides listed by Dr. Smallman are: the ability to attack insects normally inaccessible to sprays; simple application; and continuous chemical and biological control. One of the limitations to be considered is that schradan tends to be selectively effective only against mites and certain leaf sucking plants.

Promising fields for use of systemics, however, include the application (1) for prevention of aphid transmitted diseases; (2) protection of nursery stock; (3) protection of woody ornamentals; (4) protection of vegetable crops during early growth; and (5) protection of crops not used for food, or indirectly used for food, such as cotton or hops.

The operational and residual hazards were stressed by Mr. Magner, who outlined precautions to be observed in handling toxic compounds. Suitable goggles, gas masks, respirators, and protective clothing are necessary to protect the user of toxic materials.

Fruit Control Measures

IN the section of Fruit Insects, Lee Jenkins, Univ. of Missouri, reviewed "Control Measures for the Red Banded Leaf Roller." According to Dr. Jenkins, control may be either natural or insecticidal. The natural controls include parasitic wasps, aphids and birds. A disease known as the granulosis virus has been killing the larvae in several of the north central states. The disease has been reported as important in reducing leaf roller damage in Virginia, Kansas and Indiana. In a general discussion of granulosis as a means of control, it was pointed out that this disease can be spread by grinding the infected larvae or pupae and using this powder in a spray.

Results of insecticidal studies indicated that leaf roller moths are killed when contacted by any one of the following materials: TDE (25% at 1 qt/100 gals); parathion (25% emulsion, 1 pt/100 gals); EPN 300 (27% wettable powder, 2#/100 gals). Larvae that were more than one-half grown were difficult to control. Dr. Jenkins indicated that the best control with insecticides was obtained when the larvae were less than 12 days old.

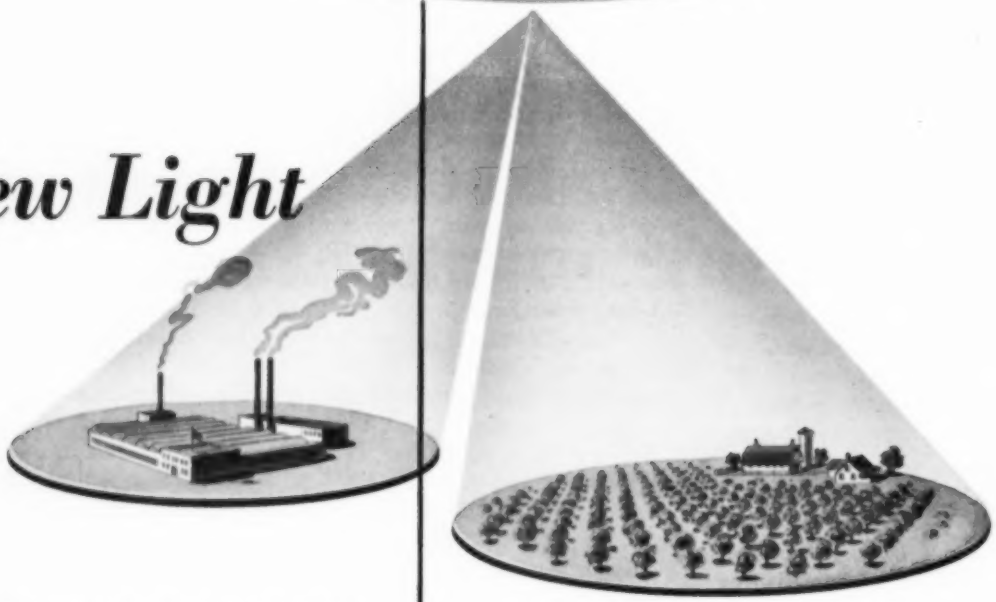
C. R. Cutright, Ohio Agricultural Experiment Station, Wooster, reported on the "Abundance and Control of the Apple Maggot," indicating that lead arsenate sprays are recommended for control, with lesser attention to DDT and methoxychlor. Dr. Fluke of Wisconsin, indicated that dieldrin presents a promising picture as a soil treatment to kill larvae or pupae. In a further discussion of the subject, D. W. Hamilton, U.S.D.A., BEPQ, Illinois, suggested that the increase in maggot population in north central states in the past two years might be related to present day spray schedules. A further comment from the group called attention to

TRONA

INDUSTRIAL AND AGRICULTURAL CHEMICALS

ESTON CHEMICALS

New Light



TRONA-ESTON CHEMICALS INCLUDE:

TRONA† BRAND	THREE ELEPHANT BRAND*
Lithium Chemicals	Borax, Technical (coarse and fine granular-powdered)
Muriate of Potash (chemical and agricultural grades)	Boric Acid, Technical and U.S.P.
Sulphate of Potash	PYROBOR* Dehydrated
Potassium Pentaborate	Borax, Technical (coarse and fine granular)
Salt Cake	Pentahydrate Borax (refined)
Desiccated Sodium Sulphate	TRONABOR* Pentahydrate
Soda Ash	Borax (crude)
Sodium Pentaborate	

ESTON BRAND

ALKRON* (parathion formulations)	ESTONOX* (toxaphene formulations)
BROMOFUME* (soil fumigants)	Organic bromides
ESTOMITE* (residual type miticide)	TETRON* (Tetraethyl pyrophosphate formulations)
TUMBLEAF†† (defoliants)	ESTONATE* (DDT dust concentrates and emulsifiable solutions)
TUMBLE-WEED† (herbicides)	

*Trade Mark Registered
†Trade Mark American Potash & Chemical Corp.

TRONA

INDUSTRIAL AND AGRICULTURAL CHEMICALS

ESTON CHEMICALS

ON OLD SUBJECTS...

Agriculture and Industry are as old as written history; old subjects, it is true, but through the years chemistry has altered established formulas and radically changed the accepted methods of both.

American Potash & Chemical Corporation has, since its earliest beginnings, supplied basic chemicals for both industry and agriculture. It now adds to these the Eston brand of fumigants, insecticides, herbicides, defoliants and refrigerants. Thus American Potash broadens its line of agricultural and industrial chemicals. It will continue to do so as other Trona, Three Elephant, and Eston brand products follow to meet customer requirements and market demands.

Keep an eye on American Potash.

PROVED CHEMICALS FOR INDUSTRY AND AGRICULTURE

American Potash & Chemical Corporation

*Offices** 3030 West Sixth Street, Los Angeles 54, California
122 East 42nd Street, New York 17, N. Y.

* ESTON CHEMICALS DIVISION
3100 East 26th Street, Los Angeles 23, California

*Plants** Trona and Los Angeles, California

the recent moist climate as being another contributing factor.

An open discussion of the "Recent Advances in Plum Curculio Control," brought many comments and questions from the members. R. W. Rings, Ohio Agricultural Experiment Station, Wooster, reported on the comparative effectiveness of several new insecticides. According to Dr. Rings, the methyl homolog of parathion in emulsifiable form gave a more rapid knockdown than parathion, even when used at lower dosages . . . the oxygen analog also gave rapid knockdown. However, it was used at nearly twice the concentration of methyl parathion. He reported that Metacide 50 showed considerable toxicity at a dosage of 1 pint of 50% concentrate in 100 gals of water. Endrin and isodrin, at heavy doses have a toxicity comparable to parathion. In the course of discussion it was pointed out that the timing of insecticide application is very important in curculio control.

Reviewing "The present Status of Spider Mite Abundance and Control," D. W. Hamilton pointed out that in 1952 orchard mites seemed unusually difficult to control, primarily because the natural enemies had been reduced by DDT, hot weather, and the fact that resistance to parathion may be becoming important.

According to Dr. Hamilton, several materials have been developed in recent years, which give better control of the red mite than parathion. Parathion has continued in spray schedules, however, since it also controls the codling moth, Forbes scale, red banded leaf roller and plum curculio. Among the new materials showing good control are: Aramite, which has been particularly effective where mites are difficult to control, especially in hot weather . . . it is used as a 15% wettable powder at 1½ lbs./100 gals, . . . but has no control value for other pests; EPN at ½ # 25% wettable powder aids in controlling plum curculio and codling moth larvae. Ovotran has also been found effective in preventing mite buildup . . . it has been applied at ½# of 50% wettable powder in three early season applications. Late season applications may cause an off flavor.

Control By Soil Applications

IN a discussion of chemical applications to the soil for insect control, H. C. Cox, Iowa State College, indicated that insecticides may be applied to the soil in the following four basic ways: (1) as seed treatments, (2) in transplanting or setting water; (3) in fertilizer mixtures, and (4) as a direct application to the soil.

Dr. Cox said that inasmuch as continuous rotation is not always the most practical cropping process, particularly in high cash crop areas, where large acreages of forage crops are undesirable, maintaining soil nutrition by chemicals is welcome.

He reviewed a relatively recent type of direct soil treatment, which uses a granular insecticide formulation possibly substituting for insecticide-fertilizer mixes in states where the latter are prohibited or unpopular. He then detailed several types of sprayers and distributors, which may be used for chemical application to the soil, and mentioned the work being done to apply a spray of an insecticide mixed in liquid nitrogen fertilizer, such as solution 32.

Studies of another phase of soil insect control, namely seed treatments, were reported by J. H. Lilly, also of Iowa State College. He indicated that among the crops involved in this type of treatment, both commercially or experimentally, were corn, rice, small grains, cotton, sorghum, soybeans, beans, beets, onions, tomatoes, okra, lettuce and peas. He indicated that the general forms of practically all of the common chlorinated insecticides and most of the organic phosphates were tried against wire worm, seed maggot, seed-corn beetles, nematodes, rodents, and in the case of systemic insecticides, mites and aphids.

According to Dr. Lilly, lindane and other insecticides may be used with a fair degree of safety on seed corn to be stored for prolonged periods before planting . . . also systox, parathion and Stauffer nematocide compound N 244 have been successful in control of white tip of rice by seed treatments.

In a report on the "Biology and control of *Phyllophaga rugosa* on Soybeans," J. H. Bigger, Illinois Natural History Survey, Urbana, indicated that an application of 1.5# DDT per acre during the peak of beetle flight to soybean strips, resulted in 55% less young grubs in the fall than the untreated check strips.

In the course of the general business sessions of the conference, the north central states branch voted to admit Montana and Wyoming to its section. A formal motion to become a section of the Entomological Society of America was also passed. The various resolutions for the year were reported by H. Gunderson, Iowa State College, chairman of the resolutions committee. Other members of this committee are W. W. Franklin, Exper. Station, Hayes, Kansas; J. E. Bussart, Velsicol Corp., Wheaton, Ill.; and A. Peterson, Ohio State College, Columbus.

Gunderson

The nominating committee appointed for the new term included: H. O. Deay, Purdue Univ., Lafayette, Ind. as chairman; M. Sanderson, Illinois Natural History Survey, Urbana; and F. Fletcher, Dow Chemical Co., Midland, Mich. Local arrangements for the St. Louis Meeting were directed by Lee Jenkins, Univ. of Missouri, chairman; J. M. Magner, Monsanto Chemical Co., St. Louis; H. P. Petty, Univ. of Ill.; P. C. Stone, Columbia, and R. E. Roselle.

A highlight of the two-day conference was a buffet supper and entertainment provided through the courtesy of the Monsanto Chemical Co.

The program for the eighth annual conference was organized by a committee chairmaned by L. K. Cutkomp, Univ. of Minnesota, and including E. Hixson, U. of Nebraska; and D. W. Hamilton, BEPQ, Vincennes, Ind.

for correction of mineral deficiencies...

SEQUESTRENE METAL COMPLEXES

It's been an impressive beginning, this correction of iron deficiency in Florida citrus. Consider, trees have been restored to full vigor and yields increased by 5 to 10 times in severe cases of deficiency.

The significance? Applications of Sequestrene iron complex **have** corrected one of the most difficult deficiencies to cure, but in addition this complex has emphasized the prospects of the other Sequestrene metal complexes. These complexes are being field tested on such crops as peaches, pears, cherries and vegetables as well as field, pasture and forage crops and various flowers. Thus, the more efficient and effective method of treating plant deficiencies may be very close at hand.

Experimental quantities of Sequestrene in combination with iron, zinc, copper, manganese, and calcium are available to qualified applicators upon request.

*"SEQUESTRENE" is the brand name for chelating compounds produced by Alrose Chemical Company, a Geigy Company.

Geigy

ORIGINATORS OF DDT INSECTICIDES

GEIGY COMPANY, INC. • 89 BARCLAY STREET • NEW YORK 8, N. Y.

GEIGY COMPANY, INC. ARE THE EXCLUSIVE SALES AGENTS FOR SEQUESTRENE METAL COMPLEXES IN THE AGRICULTURAL FIELD.

Va. Safety Meeting May 8

The fertilizer section for the Virginia State-Wide Safety Conference will hold its annual meeting at the Roanoke Hotel, Roanoke, Va., May 8, according to William C. Richardson, assistant manager, Fertilizer Department of the Southern States Cooperative, Richmond, chairman of the safety meeting.

Dr. Edwin C. Kapusta, chemical engineer, The National Fertilizer Association, Washington, D. C., will be the first speaker, with the topic, "What's New in Fertilizer?".

He will be followed by Curtis A. Cox, assistant manager, Manufacturing Department, Virginia-Carolina Chemical Corp., Richmond, speaking on "Case Histories". The third speaker, W. C. Creel, safety director of the North Carolina State Department of Labor, Raleigh, will discuss "How to Develop a Safety Program in a Fertilizer Plant".

Following lunch, two more speakers are scheduled to appear. W. R. Connor, Paul H. Werres Co., Washington, D. C., will talk on "Gang Way for Gangboards"; and Lawrence A. Long, editor, *Agricultural Chemicals* magazine, New York, will discuss "The Value of Publicity in Safety".

A general discussion is scheduled to follow the speakers, with Mr. Richardson acting as chairman of the session.

•

S. C. Cotton Meeting Held

Control of cotton insects and diseases, seed treatment, and weed control were among topics discussed at the March 5th meeting of the South Carolina State Cotton Committee held in Columbia, S. C.

A panel composed of representatives of agricultural agencies, commercial and credit organizations and farmers, brought out information that more weevils went into hibernation last fall than in any similar time during a 10-year period starting in 1942 (except the fall of 1949). Materials and equipment for cotton insect and disease control will be adequate, provided farmers secure such materials in advance; and fertilizers will also be adequate, provided supplies are brought to the farm early. The same general availability was noted for farm credit and planting seed.

That progress is being made in chemical weed control was shown by reports and discussions presented by a panel. Members of the panel were research and extension service workers and representatives of farms which applied the recommended chemicals last season. Favorable reports were also made on flame control of weeds.

Dr. M. D. Farrar, entomologist, S. C. Crop Pest Commission, reported that while no pink bollworms have been found east of the Mississippi River, South Carolina has been asked to cooperate in establishing a quarantine line and in conducting research looking toward prevention of infestation and establishment of control measures. D. W. Watkins, director, Clemson Extension Service; Dr. H. P. Cooper, director, South Carolina Experiment Station; and Dr. Farrar were asked to study this situation and take such action as they deemed best.

•

Dr. Chapman Retires

George H. Chapman, fumigation expert, has announced his retirement from American Cyanamid Co. as of March 31. Dr. Chapman

Potomac APS Division Elects Dr. May

The Potomac Division of the American Phytopathological Society met in its tenth annual conference at the Bureau of Plant Industry Station auditorium, Beltsville, Md., February 19 & 20.

The group elected as president, Dr. Curtis May, U.S.D.A., Beltsville, Md.; and Dr. John W. Heuberger, University of Delaware, Newark, Del., vice-president. Secretary-treasurer for the year will be Dr. H. Rex Thomas, U. S. D. A., Beltsville; and councilor, Dr. William J. Zaumeyer, also of the U.S.D.A.

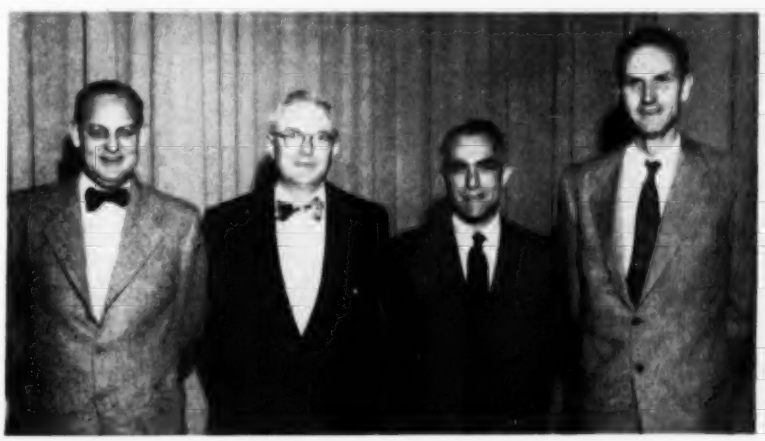
As president, Dr. May succeeds Dr. J. B. Demaree.

Dr. Paul R. Miller, U.S.D.A., Beltsville, Md., was chairman of the program committee composed of Drs. L. P. McColloch and K. W. Kreitlow.

Chairmen of the various sessions of the two-day meeting included J. B. Demaree, A. L. Taylor, H. H. McKinney and R. S. Cox.

The annual banquet was held on the evening of February 19, with Dr. Demaree as chairman. Speaker of the evening was Dr. J. G. Harrar, deputy director for agriculture of the Rockefeller Foundation, who discussed "International Cooperation in Agriculture."

Photo Below



New officers named by the Potomac Division, American Phytopathological Society at the annual branch meeting, Beltsville, Md., late in February. From left to right: Dr. William J. Zaumeyer, councilor; Dr. Curtis May, president; Dr. John W. Heuberger, vice-president; and Dr. H. Rex Thomas, secretary-treasurer.

only ORTHO Lindane* gives you all these advantages:

+ GUARANTEED GAMMA -minimum pure gamma isomer 100%. ORTHO Lindane assures you of true Lindane quality actually higher than minimum Government requirements for pure Lindane.

+ EASY FORMULATIONS -easily handled -- easily formulated as a spray or dust. ORTHO Lindane crystal particles are dry, free-flowing. Easily ground to micro-size.

+ STABILITY -chemically stable.

+ MANUFACTURING "KNOW-HOW" -made exclusively by the original manufacturers of Lindane in the U.S.A.

* *ORTHO* Lindane is a truly amazing insecticide offering high potency, rapid action, and residual control. Kills more than 200 varieties of insects by contact, vapor action, and stomach poison.

always—you profit with ORTHO

For complete information, "Story of Lindane," write:

CALIFORNIA SPRAY-CHEMICAL CORP.

Maumee, Ohio	Portland, Ore.	Whittier, Calif.
Medina, N. Y.	Sacramento, Calif.	Caldwell, Idaho
Linden, N. J.	San Jose, Calif.	Maryland Heights, Mo.
Shreveport, La.	Fresno, Calif.	Oklahoma City, Okla.
Goldsboro, N. C.	Orlando, Fla.	Phoenix, Arizona

Home Office: Richmond, California

World leader in scientific pest control

ORTHO

SCIENTIFIC PEST CONTROL

had been associated with Cyanamid since January 1, 1934. Since that time, he has established a wide reputation as a specialist in the use of liquid HCN and Cyanamid's product "Acrylon."

Before joining Cyanamid, Dr. Chapman had gained wide experience in tobacco fumigation. He had spent 14 years at the Massachusetts Agricultural Experiment Station at Amherst; three years as manager of the Puerto Rico Leaf Tobacco Company, San Juan, P. R.; and three years as director of the Connecticut Tobacco Experiment Station, Windsor, Conn.

After retirement, Dr. Chapman has said he will engage in grain fumigating work in which he has been prominent during the past years.

•

NFA Issues Booklet

"Fertilizer . . . a Cornerstone of the Welfare of the Nation" is the title of a new brochure issued recently by the National Fertilizer Association, Washington, D. C. The phrase, excerpted from "Resources of Freedom," a report to the President by the Materials Policy Commission, is expanded into a graphic presentation showing the economic value of fertilization. The book points out that cropland per capita is less; that a ton of fertilizer produces so many bushels or pounds of corn, beef, cotton, wheat and potatoes; that today 25% of all U. S. crop production comes from fertilizer; that use of fertilizer lowers the per unit cost of agricultural production. The book has been distributed nationally by the NFA.

•

APS to Wisconsin in Sept.

The American Phytopathological Society will be one of eighteen scientific societies to meet at the University of Wisconsin, September 6-9, in connection with the American Institute of Biological Sciences. Total attendance is expected to reach 3,500.

Meeting plans for the phytopaths have not been announced, but the committee is reported to be in the process of formulating a program. The corresponding meeting was held last fall at Ithaca, N. Y.

Book Reviews

Spraying, Dusting and Fumigating of Plants by W. S. Hough and A. F. Mason. Published by MacMillan Co., New York. 726 pages, 6 x 9 inches, cloth binding.

This revised edition is prepared in two parts. The first section contains a brief history of the development of pest control, including discussions of the more important insecticides, fungicides, herbicides, and other materials used in protecting crops. Part 2 is a systematic treatment of all the important plant pests and diseases. A brief description of each disease is included, as well as a key for diagnosing various plant problems. Crops covered include orchard and bush fruits, and vegetables of all kinds, as well as tobacco and cotton.

A number of photographs, drawings and charts clarify the text. References are included with every chapter and the book contains a complete author and general index.

* * *

Fundamentals of Fruit Production By V. R. Gardner, F. C. Bradford, and H. D. Hooker. Published by McGraw-Hill Book Co. 740 pages, 6 x 9 inches, cloth binding, price $9.00. This third edition brings up to date the latest findings in modern fruit production. Two new sections included concern Light Relations, and Growth Regulators. The text, in general, focusses on the tree's growth and its steadily increasing requirements.

The book has seven basic sections including: Water Relations, Nutrition, Temperature Relations, Pruning, and Fruit Setting. Various charts and graphs serve to clarify the text.

* * *

Hanna's Handbook of Agricultural Chemicals by Lester W. Hanna. 210 pages, 4 x 7 inches, flexible paperboard cover.

A recent addition to the library of books on agriculture is this handbook of fertilizers, fumigants, fungicides, herbicides, insecticides, rodenticides, and list of antidotes. Hanna has arranged the chemicals alphabetically, using at times the chemical names and at other times the trade name. Where compounds are toxic or dangerous, Hanna has defined antidotes and caution measures. A list of about 90 references is contained in the book.

•

Liquid Krilium Available

A new liquid formulation af Krilium soil conditioner which may be used at a cost as low as $5 per acre, has been announced by Roy L. Brandenburger, Monsanto Chemical Co., general manager of the merchandising division. He describes the new product as being specifically formulated for crust control in surface application by growers of row crops. "Krilium Soil Conditioner Liquid in no way replaces or duplicates the currently available powder formulations of Krilium," he said.

Krilium Soil Conditioner Liquid is marketed at a retail cost of $7.50 per gallon in single-gallon units, as of March 26, through the national distributor-dealer organization currently handling other Krilium formulations. In five-gallon containers the product will cost $5.92 per gallon, while in 55-gallon drums it will cost $5 per gallon, the company says.

•

CCDA in N.Y. Meeting

An all-day meeting of the Commercial Chemical Development Association was held at the Statler Hotel, New York, March 23. Speakers included leaders in the chemical industry who discussed topics dealing in various ways with the general subject of "Economics and Commercial Chemical Development."

Richard B. Schneider, vice-president, Empire Trust Co. was chairman of the meeting, with the

DO YOU KNOW THE TOP MAN IN OUR COMPANY?

In some companies it's the president who is the real boss. In others it's the chairman of the board. In our company it's you — the customer.

We sincerely mean this. Our entire operation is based on the idea of giving each customer service that is hand-tailored to fit his individual requirements.

That means you get the right container for your product and processing methods. You get deliveries scheduled to your needs and not our convenience. Research, engineering and trouble-shooting services are available in the amount you need — when and where you want them. We have only one rigid idea: *The customer is top man and it's our job to please him.* Won't you give us a chance to prove it?

MANY FRIENDS of the Benj C Betner Co. — now the Betner Division of Continental Can Company — are valued customers of Continental as well. They can now place all their packaging orders with a single supplier of recognized reliability, resourcefulness and technical ability. Every Continental office is a Betner office.

BETNER
Division
CONTINENTAL CAN COMPANY, INC.
DEVON, PENNSYLVANIA

Plants also located in RICHMOND, VA., PARIS, TEX., BEAUMONT, TEX., APPLETON, WISC. and LOS ANGELES, CALIF.

following appearing on the program: Carl Gerstacker, treasurer, Dow Chemical Co.; Enest Hart, vice-president, Food Machinery & Chemical Corp.; William K. Beckers, Spencer Trask & Co.; C. E. Waring, vice-president, Davison Chemical Corp.; S. T. Ellis, vice-president, Commercial Solvents Corp.; William H. McLean, vice-president, Merck & Co., Inc.; and Thomas Vaughn, vice-president, Wyandotte Chemical Corp.

The Commercial Chemical Development Association Honor Award was presented to Charles W. Walton, president of the Association and general manager of the Adhesives & Coating Division of Minnesota Mining and Manufacturing Co. Introduction of Mr. Walton was made by Frank E. Dolian, manager, market development department, Commercial Solvents Corporation and Kenneth H. Klipstein, assistant general manager, Calco Chemical Division of American Cyanamid Co. made the award address.

Mr. Hart discussed "Expansion by Acquisition," pointing out both advantages and disadvantages of such. He said that there is no fine line between expansion by acquisition and other methods of expansion, and in many successful cases of expansion, several methods have been used simultaneously. There should be sound and compelling reasons for expansion before such a move is undertaken, he warned. He also cautioned against may pitfalls in the process of acquisition, particularly in bringing about an overall policy to fit the needs of both parties involved.

•

November CFA Meeting

Carmel-By-The-Sea, California, has been announced by the California Fertilizer Association as the meeting place of its annual convention, November 9 & 10, 1953. Sidney H. Bierly, executive secretary of the CFA says that the program of the opening day will be of formal nature with the group meeting at the Golden Bough Theater in Carmel.

The second day will be devoted largely to social events including golf at the Monterey Peninsula Golf & Country Club. The annual CFA banquet will be held at the Country Club on the evening of November 10.

•

N. C. Fertilizer Co. Sold

The Reliance Guano Company, Whiteville, N. Carolina, has recently been sold to Southern States Phosphate & Fertlizer Co., Savannah, Georgia, it has been learned. Formal transfer took place in March.

TECHNICAL BRIEFS

(*Continued from Page 65*)

ficult to control without accompanying detrimental effects. Many insecticides, useful from other standpoints, are unusable in connection with sweet potato crops because of taste residues. Testing has established the fact that the use of aldrin in the soil does not affect the taste of the sweet potato.

The label recommends that the aldrin formula be sprayed over the surface of the sand or loam soils at the rate of three pounds of actual chemical to the acre. The land should be harrowed or disced so that the insecticide is thoroughly mixed with the top three to six inches of soil. A good kill of wireworms will result, and control will last for a year or more. At this rate aldrin is one of the most economical as well as one of the most effective methods of wireworm control yet developed, according to F. W. Hatch, manager, Julius Hyman & Co. Division, Shell Chemical Corp., Denver, Colo., manufacturers of aldrin.

BULLETINS

(*Continued from Page 63*)

pany states that the magnets are non-electric and their new design increases their magnetic strength by as much as 50%. It is stated that the new magnets are Mill Mutual approved for Class A and Class B installations.

Bulletins are available from the Dings Magnetic Separator Co., Milwaukee 46, Wisconsin.

•

Offers Herbicide Data

Carbide & Carbon Chemicals Co. has produced two folders describing "Crag Herbicide-1". The first, designated "F-7875", is prepared for commercial growers and lists the crops on which the herbicide may be applied. These include strawberries, raspberries, asparagus, field and sweet corn and citrus as well as various ornamentals.

The other booklet, "F-8154", is geared to the interests of the home gardener. Both folders are entitled "Prevent Weeds Before They Grow". Copies are available from Carbide & Carbon Chemicals Co., Rm. 308, 30 E. 42nd St., New York 17, N. Y.

•

Ethyl to Make 2,4,5-T

Ethyl Corporation, New York, has announced that it is producing 2,4,5-T in commercial quantities. The product is being produced as the acid and as the butoxy-ethoxy-propanol ester for the preparation of low volatile ester formulations. The company will market its production to agricultural chemical compounders.

Ethyl Corp. is also a producer of benzene hexachloride and is currently completing a new plant for the manufacture of lindane. The entrance of the company into herbicide production is part of its continuing program to make available useful chemical tools to agriculture and industry, company spokesmen stated.

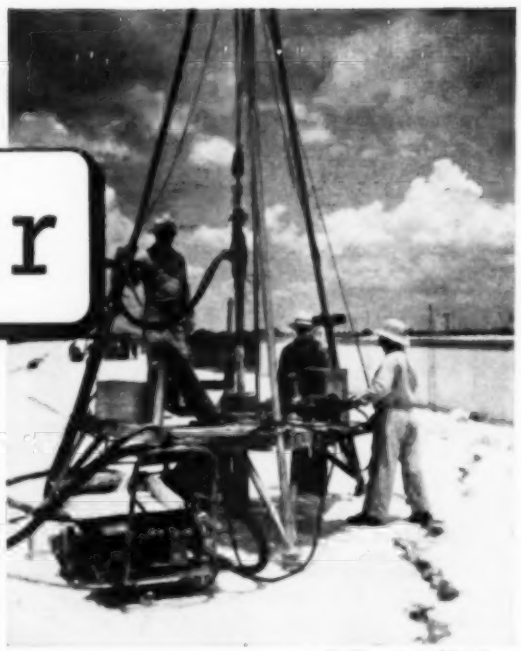
NAC MEETING

(*Continued from Page 34*)

McClintic, Pure Carbonic Company, New York, declared that in many firms there is a "vacant chair at executive meetings" which, he said, should be occupied by a transportation executive.

He declared that the supervision of transportation service demands the constant attention of a specialist, pointing out that "a well-organized industrial traffic department can be an important factor in

Sulphur



Drilling a vat of Sulphur preparatory to blasting down

Thousands of tons mined daily, but where does it all go?

All through the open seasons—spring, summer and fall—homes everywhere are being painted, old houses as well as new getting much needed protection from the elements. It's an activity seen by millions but few realize how important Sulphur is to this phase of our domestic economy. Actually, it's an essential commodity.

That's right. Paint pigments constitute one of the largest individual consumers of Sulphur . . . in the form of sulphuric acid. Government statistics show that for the year 1950 some 1,260,000 tons of 100% H_2SO_4 were consumed by producers of lead, zinc and titanium pigments. Translated into Sulphur, this means around 400,000 long tons which is a lot of Sulphur! In fact, the pigment industry stands 5th on the list of the many industries that consume Sulphur in one form or another during their manufacturing processes.

The Sulphur Industry indeed has many mouths to feed, all important to our economy and standard of living.

Texas Gulf Sulphur Co.

75 East 45th Street, New York 17, N. Y.

Mines: Newgulf and Moss Bluff, Texas

lowering production costs and increasing sales."

Reminding that transportation of agricultural chemicals is a complex problem, he advised his hearers that a good traffic department can help widen a company's markets and open up new sources for raw materials. The item of transportation costs ranks high in company expenditures, being surpassed only by the items of raw materials and labor, respectively.

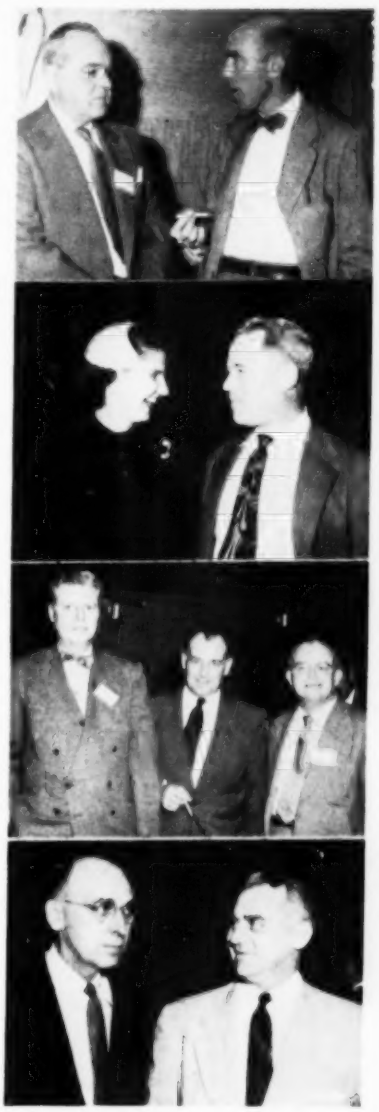
Wise choice of plant location or of warehouse sites can save considerable amounts of money, Mr. McClintic pointed out. "In many instances," he said, "two or three miles' difference of location in a rail rate territory might save possibly from 10% to 15% on rail or truck rates." Since carriers have three main specific territories, divided further into sub-territories, it is always wise to look into this angle before a decision is made.

The official territory, he said, is comprised of that roughly east of Chicago, St. Louis and Memphis and north of the Ohio river; the southern territory is regarded as all territory east of the Mississippi and south of the Ohio river. Western and southwestern territories are west of the Mississippi.

In reference to chemicals used for agricultural pest control, he said that the total claims for insecticide products in 1951 amounted to nearly $20,000. During 1952, these figures increased to approximately $26,000, the increase being due to higher priced articles involved, he said. Mr. McClintic declared that in his opinion, these claims were negligible in view of the tremendous volume of materials shipped. He complimented the industry for the fact that not one complaint from the carriers indicated that materials were packaged contrary to Interstate Commerce Commission regulations.

Weed Control Stressed

WITH an estimated $5 billion annual loss to weeds, American agriculture could gain much by greater attention to weed control, Dr. Warren C. Shaw told the group. Dr. Shaw, agronomist of the Division of Weed Investigations, Bureau of Plant Industry, Soils, and Agricultural Engineering, U.S. Department of Agriculture, Beltsville, Md., reviewed the progress made in herbicidal development in the past two decades and pointed out the retarding effect of weeds in the growth of agricultural crops. Ragweed requires three times as much water as corn, for instance, and other weeds steal plant food intended for valuable plantings. On an average, he declared, weeds cost the farmer at least 8% of his profit.



In the Photos

Top: W. G. Reed, U.S.D.A., Washington, D. C. and Friar Thompson, agricultural chemical consultant, Athens, Ga.

Second picture: Mrs. E. A. Epps and Mr. Epps, Louisiana State Chemist, Baton Rouge, La.

Third: E. L. Thomas, Swift & Co., Chicago, Ill.; Howard Whamond, Velsicol Corporation, Chicago; and E. H. Rappe, Swift & Co.

E. N. Shelton and L. S. Kaniecki, Tennessee Corporation, Atlanta, Ga.

Although significant progress has been made in weed control during the past 25 years, the ten-year period since 1943 has witnessed the most significant changes. These, he said, were the introduction of 2,4-D; of pre-emergence treatments; and of low gallonage applications.

The trend today is toward greater specificity in herbicidal action, he said, with the use of herbicides working well with other good cultural practices.

The ultimate goal of controlling weeds in cereals is now a reality, which shows tremendous progress. He reported further that the dinitros have been successful in controlling weeds in peanuts; that CMU has done well in soybean plantings; that band applications of herbicides in cotton have shown promise and the use of dinitros in alfalfa has controlled weeds there. Through the use of carbamates, grasses have been removed from alfalfa and weed-free legumes have become possible.

The importance of proper timing was emphasized by Dr. Shaw, who reported that selection of the optimum time to apply a herbicide often makes the difference between excellent control and a very poor showing.

Many problems still remain to be solved, however, the speaker reminded. The regrowth of mesquite after its apparent killing by 2,4,5-T is one unanswered question, as is the problem of why some species respond to herbicidal treatment while others fail to do so.

Control of aquatic weeds in fresh water lakes is a problem from a number of angles, including that of protecting fish.

Production and use of herbicides has reached large proportions, he reported. Sodium arsenate pro-

Your Insurance for BETTER CROPS!

CORONA CHEMICAL DIVISION

PITTSBURGH PLATE GLASS COMPANY

MILWAUKEE, WIS. MOORESTOWN, N. J.

duction was listed as 59 million pounds; sodium chlorate, 14 million; 2,4-D, 29,500,000 pounds; 2,4,5-T, 8 million pounds and the dinitros, 4 million pounds. Many millions of acres of corn and cereals have been treated with various herbicides, he said, while some 400,000 acres of mesquite have been covered with applications of 2,4,5-T.

Sen. Ellender Speaks

POINTING out what the use of agricultural chemicals means to the South, Senator Allen J. Ellender, Louisiana, member of the Senate Committee on Agriculture and Forestry, told the group that our nation is faced with the alternative of either stepping up agricultural production or lowering the standard of living for future generations. With the population increasing at its present rate of around 6,000 persons a day, by 1975 the U.S. population will be some 190 million. To feed and clothe these added numbers, a hundred million additional acres will be needed for agricultural production, but it will be impossible to get them. He expects a shortage of some 23 million acres which means that the use of pesticides and of efforts to conserve soil fertility must increase the yield per acre. "We must make full use of these chemical tools," he declared, adding that adequate pest control must go hand in hand with the soil fertility program, neither being complete without the help of the other.

In the south, agriculture is producing considerably under its potential, but this can be corrected by wise rotation of crops; through increased use of pesticides to control both insects and plant disease; and through application of more and more fertilizers.

PRESIDENT Mohr was chairman of Friday morning's program, which completed the three-day convention. Joseph A. Noone, technical adviser for the Association, brought the group up to date on legislation pending in various state capitals. He reported that at the latest count, some 150 bills having to do with the manufacture, distribution or application of pesticides were being introduced in the legislatures of 44 states this year. In addition, the Delaney Bill (HR 2245) demanding pretesting of all chemicals for agricultural use, has been introduced in Congress this session. One federal and one state bill require complete formula disclosure, listing all of the inert ingredients as well as the active ones.

Mr. Noone declared that the general tendency in many of the proposals in state legislatures, is to control all applicators of pesticidal materials, including not only custom operators, but growers and gardeners as well. Under such rules, nearly everyone would have to be licensed. Licenses to sell pesticides are also being sought by some states, apparently as a means to gain more revenue. Such hazards are likely to increase, Mr. Noone indicated, until a product might be taxed through every step from registration to final application.

Top Quality Material

Technical Grade	High Concentrate	Emulsions

DDT
BHC
ALDRIN
DIELDRIN
LINDANE
CHLORDANE
TOXAPHENE
PARATHION

meeting WHO specifications

PHILGO CHEMICAL & PRODUCTS CORP.
333 N. MICHIGAN AVE.
CHICAGO 1, ILL.
Leonard W. Gopp, Pres. Phone, STate 2-9829

New Agricultural Chemicals Helping American Farmers

PARATHION Originally developed by Farbenfabriken Bayer and now manufactured in this country by Chemagro Corporation, parathion is an insecticide of established effectiveness and constantly widening use.

SYSTOX* Common name of active ingredient: demeton. A systemic insecticide, revolutionary in its mode of action. Highly effective against sucking plant pests such as aphids and mites. Used commercially with outstanding success on cotton and in widespread tests on various other crops in 1952. The potential usage and economic importance of SYSTOX appear very large.

NITROX* Common name of active ingredient: methyl parathion. NITROX appears effective against bollweevil, aphids, mites and thrips on cotton. In combination with DDT protection against bollworm and pink bollworm is also indicated. No other insecticide appears to offer protection against so wide a range of cotton insects.

METACIDE* A mixture of parathion and methyl parathion in a special emulsifier which has the property of reducing the skin toxicity of the liquid concentrate. Highly effective against a wide range of insects on many crops.

* REGISTERED TRADEMARK OF CHEMAGRO CORPORATION

CHEMAGRO CORPORATION

350 FIFTH AVENUE, NEW YORK 1, N.Y.

Loss of some 140 million board feet of southern timber resulted from the activities of the pine bark beetle and another pine defoliating insect, the group was told by R. Joseph Kowal, senior entomologist in charge, Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U.S. Department of Agriculture, Gulfport, Miss. The economic importance of forest insects and the great need for research for means of their control has been pointed up in recent epidemics which have caused millions in damage.

Several examples given by Mr. Kowal included the loblolly pine sawfly in Arkansas, which, through its defoliating activity, caused a growth loss of 20 million board feet in 1947; and substantial losses both before and since that peak time. DDT applied by aircraft will control the larvae effectively, and this procedure has been accomplished in Louisiana. He added, however, that other toxicants might be of equal value, but that more work needs to be done before this can be established.

The southern pine beetle was described as "the most destructive bark beetle in the south." This pest, it was noted, has been on the ascendency in recent years. One large epidemic in East Texas killed 85 million board feet of sawed timber in 1950 and 1951 while another epidemic in southern Mississippi killed 30 million board feet in 1952.

Still another insect pest, the black turpentine beetle, has increased to the proportion of a "primary killer of pines." He stated that in the past three years, it has killed at least 8 million board feet of timber in Texas, Louisiana and Mississippi in known outbreaks.

Calling for an increased research program, Mr. Kowal said that in 1952, about half of all trees planted in the nation were planted in the South. As trees reach maturity, he warned, the damage from insect attack becomes increasingly serious and measures to avoid it or to control it are necessary.

Lauding the application of agricultural chemicals as a means for increasing both production and profit to the grower, Dr. Eugene Butler, editor of *Progressive Farmer* magazine, declared that some farmers have saved from $10 to $20 per acre by chemical weed control over hand methods and ordinary cultivation. He described the lack of adequate weed control in cotton as "the strongest barrier to complete cotton mechanization." In some sections of the South, some 100 man-hours of labor per acre are required to grow cotton and about half of this is spent in hand hoeing.

However, since the use of chemicals is more complicated than former methods of weed control, the grower must prepare himself with information on materials, equipment and know-how before attempting to make use of various products, he warned.

Quoting some statistics about chemical use in the South, he reported that about 300,000 acres of cotton

CHEMICALS FOR AGRICULTURE

✓ Check High Analysis Value

COPPER SULPHATE

Crystals
Superfine
Powdered
Basic Copper Sulphate
✓ 53% Copper as metallic

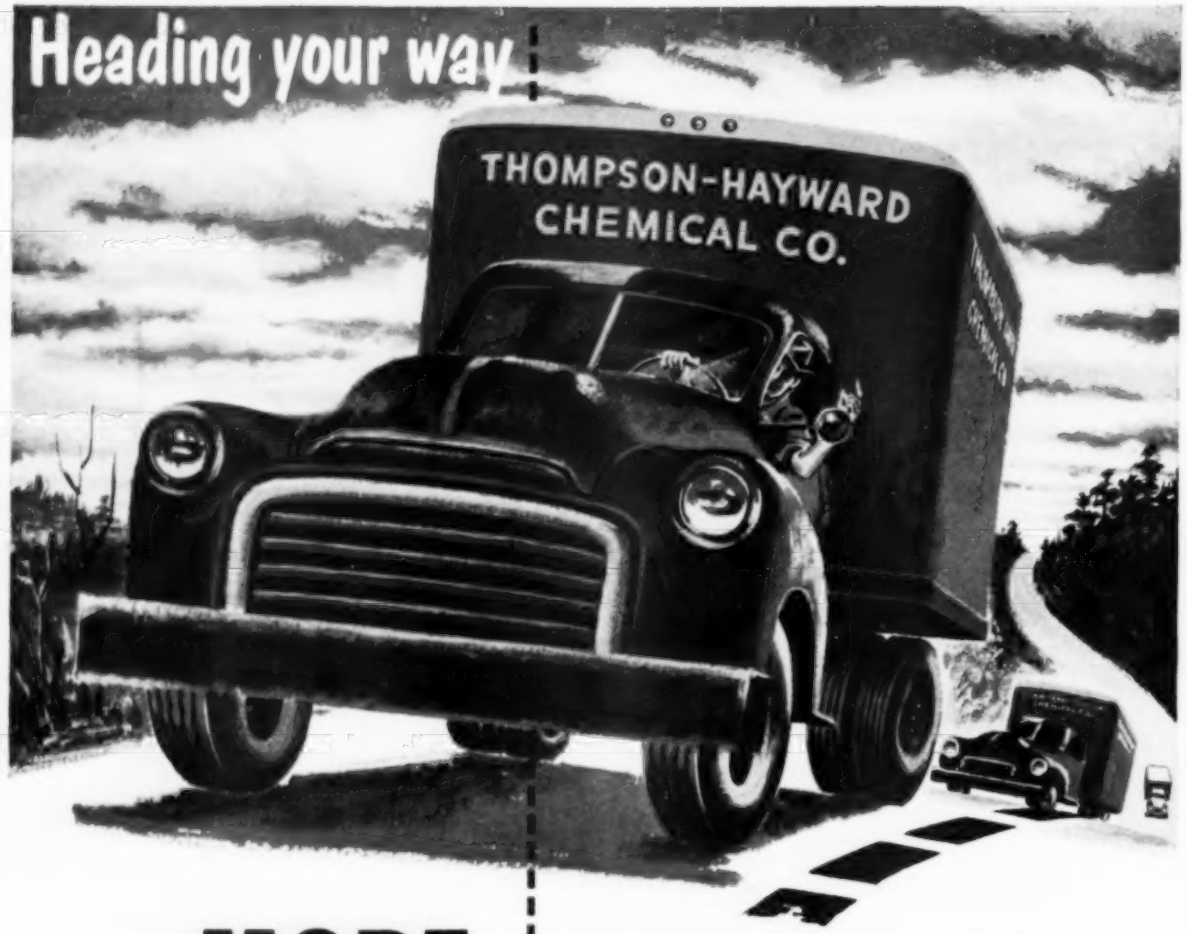
ZEE-N-O

Neutral Zinc 56% Zinc as metallic
The Highest Test Nutritional Zinc
If you use Zinc Sulphate be sure to check
✓ Greater Performance and Lower Cost of Zee-N-O

MANGANO

Neutral Manganese
55% Manganese as metallic
The Highest Test Nutritional Manganese
✓ Greater Performance and Lower Cost
Non-irritating to Workmen

W. R. E. ANDREWS SALES, INC.
1805 Race Street, Philadelphia 2, Pa.
Since 1926
Agricultural Chemical Specialists



MORE farm tested PESTICIDES!

Availability's what counts in pesticide chemicals. Near-at-hand stockpoints – fast, sure delivery saves time and profits. Eighteen warehouses and a fleet of fast trucks serve the mid-states north and south! If you want your order when you want it, buy Thompson-Hayward.

LOOK FOR THE TAG ON THE LABEL

FARM-TESTED CHEMICALS

THOMPSON-HAYWARD CHEMICAL COMPANY

KANSAS CITY • NEW ORLEANS • DENVER • OMAHA • CHICAGO • MEMPHIS
DAVENPORT • WICHITA • DALLAS • HOUSTON • ST. LOUIS • DES MOINES • SAN ANTONIO
N. LITTLE ROCK • OKLAHOMA CITY • MINNEAPOLIS • TULSA • LUBBOCK

were treated with herbicides in 1952 as compared with 5,000 acres in 1947 and practically none in 1940.

Dr. Butler observed that improved results could be obtained in the South if growers would avoid the "hit-or-miss" basis on which much of the pest control is done. Farmers often wait until bugs actually appear before making any real effort to control their numbers, he said. However, some are being sold on early season control in areas where damage occurs every year from one or more insects such as thrips, aphids, fleas and boll weevils. That positive control measures are necessary was pointed out by figures compiled by the Cotton Disease Council which stated that losses due to cotton disease in 1952 amounted to nearly 2 million bales. The percentage loss reported ranges up to 30.5 per cent in N. Carolina; 10.21% in Texas; 15.8% in Arkansas and 6.5% in Mississippi.

Dr. Charles E. Palm, head of the Department of Entomology, Cornell University, Ithaca, N.Y., and president of the Entomological Society of America, reported on foreign pesticide developments, based on first-hand information gained through extensive travels. (Full text of his paper is published in this issue. See page 37)

THAT much research is needed to explore the total possibilities of systemic insecticides, was emphasized in a paper by Dr. H. G. Johnston, head of the research and development unit of the National Cotton Council, Memphis, Tenn. "Some of the recent developments look promising and may have far-reaching results in the future development of this area of research", he said, but added that there is no evidence to indicate that systemics will ever be the answer to all insect control problems or that this type of toxicant is likely to replace all others. "It is entirely possible that some of these compounds may prove to be highly effective for certain specific purposes and perhaps overcome some of the difficulties inherent in other types of insecticides", he pointed out.

Dr. Johnston reviewed the history of research in the systemic field and mentioned many of the properties such an insecticide must possess. Among other things, it must be readily absorbed either through the root or leaf cuticle so that insect pests are killed but the plant is not injured. It must also be sufficiently stable within the plant to provide prolonged residual protection. Although a high degree of water solubility is desirable, it is not essential since emulsifiable formulations can be used. For general use, the absorbed material should have a high toxicity for insects and relatively low toxicity for higher animals. Such specifications, he observed, are difficult to meet. Thus, headway in control of cotton pests by systemic action is apparently moving slowly, but many additional compounds are available for testing and it is hoped that some of these may prove to be more effective, Dr. Johnston concluded.

James T. Conner, Jr., Taylor Chemical Co., Aberdeen, N. Carolina,

Go the scientific way...go **MGK**

AEROSOL INSECTICIDE CONCENTRATES

SPRAY INSECTICIDE CONCENTRATES

DUST INSECTICIDE CONCENTRATES

You may want complete formulas . . . ready to put right into your aerosol bombs or your retail packages. You may want combinations of insecticides and synergists that leave you only the minimum of processing to do. You may want to do most of the processing yourself and to you we offer the purest toxicants and synergists in their primary forms. MGK has the *best* of whatever you want. The emblem "MGK" is satisfying assurance of high efficiency and scientific production in insecticides and insecticide ingredients. Let this single experienced source help you make better products for less money. For complete information about MGK prices write 1703 Southeast Fifth St., Minneapolis, Minn.

Scarabaeus sacer
Sacred beetle of ancient Egypt. Model for carved stone amulets and scarabs.

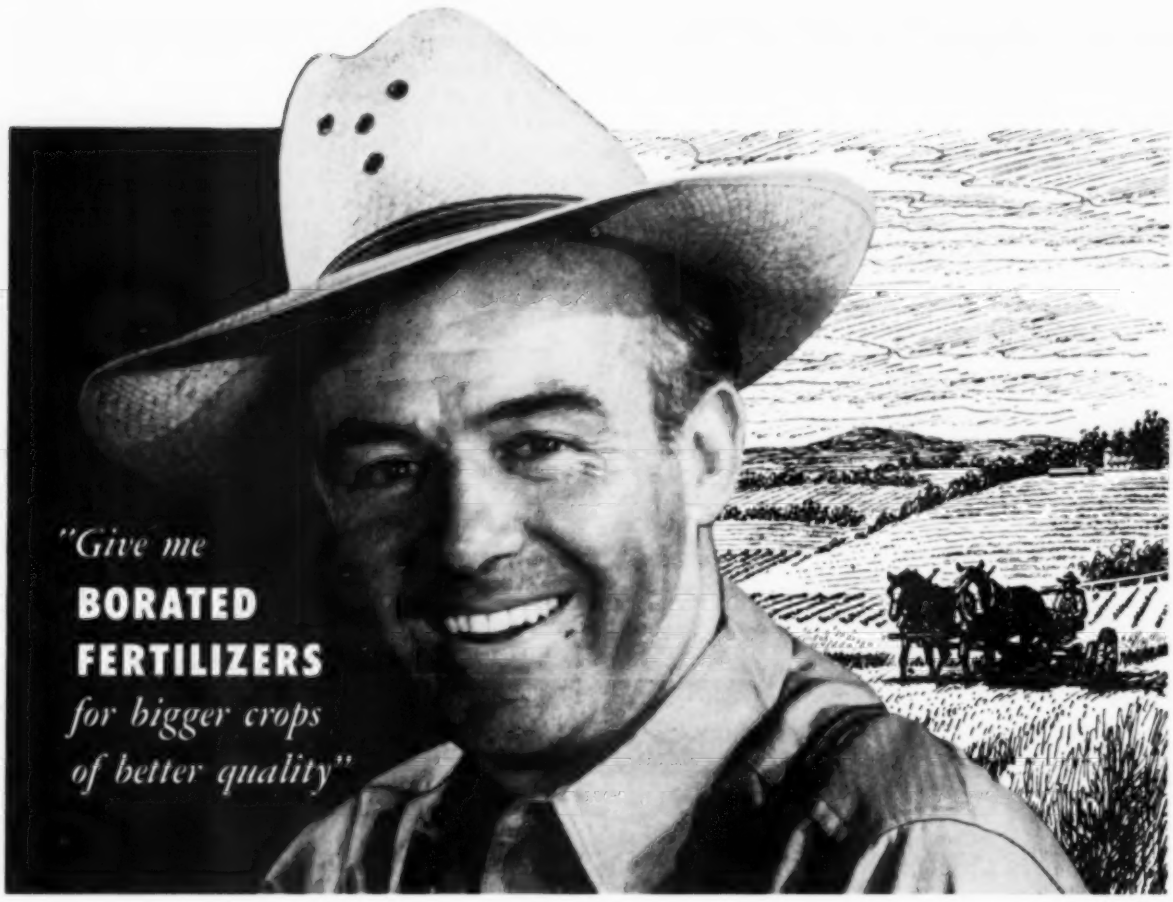
THE PIONEERS OF
PYRETHRUM AND ALLETHRIN

Good insecticides protect America's health and harvest.

McLAUGHLIN

GORMLEY

KING COMPANY



BORAX restores lost boron to soil

Yes, Borax does restore lost Boron to soils . . . the Boron that is so essential to fine, healthy crops and big yields. Although the amount of Boron required is extremely small, its importance is comparable to Nitrogen, Potash and the other essential plant foods. Don't let a Boron deficiency in soil cause crops to dwindle and plants to grow puny. Use Fertilizer Borates, the low-cost fertilizer grade of Borax, to restore the boron—then watch the yields of alfalfa, pasture crops, and many vegetable, field and fruit crops as well, increase and improve in quality!

FERTILIZER BORATE-HIGH GRADE, developed especially for the fertilizer trade, is an ore concentrate rich in Boron (*contains approximately 121% Borax equivalent*). In formulating mixtures containing Borax, only 82.9 lbs. of FERTILIZER BORATE-HIGH GRADE is required for each 100 lbs. Borax that you guarantee. Because water content is held to approximately 24% water (5 mols) this material also saves you important money in costs of transportation, storage and handling, etc.

FERTILIZER BORATE (*equivalent to approximately 93% Borax*) and FERTILIZER BORATE-HIGH GRADE (*equivalent to approximately 121% Borax*) come in fine mesh for addition to mixed fertilizer, or coarse mesh for direct application where required. County Agents or State Experimental Stations should be consulted for detailed recommendations. Write today for literature and price quotations!

FERTILIZER BORATE—The Low-Cost Fertilizer Borax

AGRICULTURAL OFFICES

P.O. Box 229—EAST ALTON, ILLINOIS
First National Bank Building,
AUBURN, ALABAMA

MANUFACTURERS OF FAMOUS "20 MULE TEAM" PACKAGE PRODUCTS

PACIFIC COAST BORAX CO.

DIVISION OF BORAX CONSOLIDATED, LIMITED

100 PARK AVENUE, NEW YORK 17, N.Y. | 2295 LUMBER STREET, CHICAGO 16, ILLINOIS | 630 SHATTO PLACE, LOS ANGELES 5, CALIF.

told how membership in a trade association such as the National Agricultural Chemicals Association benefits companies engaged in formulating. Among the benefits named by Mr. Conner was the fact that one becomes better acquainted with the entire industry and gains a broader viewpoint of the trade rather than confining one's activities and thinking to a local level. He said that one can operate his own business more intelligently after talking to others in the trade and observing their methods. Companies can learn much through this type of association, he said; ideas concerning advertising and sales and promotion; new uses for new materials, different uses for old materials; information on how to purchase wisely, what to purchase, when to purchase, and also what *not* to buy.

Mr. Conner observed further that at trade association meetings, members of the trade have the opportunity of meeting representatives of the government, federal and state agencies, experiment stations, and specialists in various phases of the agricultural chemical field.

CONTROL of forest insects can be of great benefit not only to the South, but also to the entire nation, the group was told by R. J. Kowal, U.S.D.A., Gulfport, Mississippi. He said that since 1947, epidemics due alone to pine bark beetles and one defoliator have resulted in killing of trees amounting to some 140 million board feet of timber valued at about $4¼ million. Other pests taking their toll in lumber and trees include the loblolly pine sawfly in Arkansas, southern pine beetle, black turpentine beetle and the Ips engraver beetle.

These pests, once relatively unimportant, have emerged into primary killers, Mr. Kowal said. The southern pine beetle, for instance, the most destructive bark beetle in the south, has been increasing in recent years. One outbreak in east Texas killed 85 million board feet of saw timber in 1950 and 1951 and another outbreak in southwest Mississippi killed 30 million board feet in 1952. Only small scale tests on the control of the beetle have been possible, he said. These tests have indicated that some of the chlorinated hydrocarbons are superior to the orthodichlorobenzene-fuel oil formula which has been standard in the past. BHC in a concentration of ⅜ lb. of gamma per 50 gallons of oil has given good results in Texas and Mississippi, he reported. Much remains to be done in formulation of insecticides, it was added.

Mr. Kowal reported that in 1952, 50% of all trees planted in the United States were set out in the south. "These are very susceptible to insect damage in their early years and require protection", he observed. "As trees reach maturity, the danger from insect attack becomes increasingly serious, and measures to avoid or control it are necessary. Fifteen or twenty years from now there will be many stands entering this period of

Pioneer Pesticide Products

Aldrin
Aldrin-DDT
Aramite
BHC (Benzene Hexachloride)
BHC-DDT
Chlordane
DDT
Dilan
Dieldrin
Endrin
Heptachlor
Isodrin
Lindane
Malathon
Parathion
TDE (DDD)
TEPP (Tetraethyl pyrophosphate)
Toxaphene
Toxaphene-DDT
Sulphur
Wood Preservatives
Weed Killers, Grass Killers and Brush Killers
Grain Fumigants
Rodenticides
Seed Protectants

Dust Concentrates, Wettable Powders and Emulsifiable Grades

All products available for prompt delivery. Stocks maintained in all sections of country. Shipments prepaid.

PIONEER CHEMICAL ASSOCIATES

3035 East Colfax **Denver 6, Colorado**

"A GOOD SOURCE OF SUPPLY FOR RAW MATERIALS"

PRODUCE LOW COST LIQUID INSECTICIDAL SPRAYS WITH AGRIMUL* EMULSIFIERS

Nopco® Agrimul emulsifiers for BHC, Chlordane, Lindane, Toxaphene, and other agricultural chemicals cover emulsifier needs for a wide variety of formulations.

Three distinct types are available: nonionic, anionic, and combination— to provide formulators with a versatile means of solving problems related to water conditions, coverage, and adhesion.

ALSO

Special Emulsifiers for Chloro-IPC, and 2,4-D Esters

OUTSTANDING ADVANTAGES OF AGRIMUL EMULSIFIERS INCLUDE:

Flash properties—concentrates made with Agrimul emulsifiers display plenty of desired "flash".

Ease of emulsification—emulsions of Chlordane, Lindane, BHC, and other polychlor concentrates can be prepared easily with minimum agitation.

Stability—emulsion stability can be readily controlled by varying or adjusting the quantity of Agrimul in the concentration.

Obtain a copy of Nopco's latest technical bulletin describing Agrimul emulsifiers, and giving formulas, by filling out the attached coupon and mailing it today.

Registered U. S. Pat. Off.

NOPCO CHEMICAL COMPANY
Harrison New Jersey

Gentlemen:
Please send me technical bulletin describing Agrimul emulsifiers, and giving formulas.

Name_____
Firm_____
Address_____
City_____ Zone____ State_____

NOPCO
CHEMICAL COMPANY Harrison, N. J.

Branches: Boston • Chicago • Cedartown, Ga. • Richmond, Calif.

maturity throughout the south. If this valuable resource is to be protected in all its stages, forest entomology must make sound rapid advances in the field of research and control", he concluded.

Continuing on the general theme of lumber-destroying insects, H. R. Johnston, U.S.D.A., Gulfport, Miss. spoke on "Practical Methods for the Control of Insects Attacking Green Logs and Lumber". He said that benzene hexachloride, properly applied, is effective in preventing attack by ambrosia beetles, bark beetles and wood borers on green hardwood logs and lumber and on pine logs.

He said that when applying the toxicant, one should be sure that the entire bark surface is wet. This usually requires application at the rate of one gallon per 100 square feet of bark surface.

Insecticides may be applied after the logs are stacked, provided proper equipment is used. However, to obtain best results, logs should be stacked as high as it is possible to spray them and in long, continuous rows rather than in a number of small decks.

To prevent attack by ambrosia beetles on green hardwood lumber, an emulsion of BHC containing five ounces of gamma isomer per 50 gallons of water was recommended by Mr. Johnston. This is applied by dipping in vats in conjunction with measures for preventing sap stain, he said.

John D. Conner, NAC counsel, presented an analysis of various types of liability claims filed against members of industry and pointed out the responsibilities of state and federal officials, farmers and the industry in reducing liability risk in connection with use of agricultural chemical products. He stressed the importance of safety in use.

FOREIGN PESTICIDES

(*Continued from Page 39*)

use of aircraft, although not as extensive as in some areas of the United States, is nevertheless of growing im-

portance. Problems similar to those experienced in the U. S.; namely distribution, effectiveness, proper formulation, suitable craft, economics of aircraft versus ground equipment, are being worked on and discussed. Low gallonage sprayers, thermal aerosols, low and high pressure sprayers, dusting equipment; in fact, the entire line of possible means for pesticide application is receiving attention.

Because small fields are abundant in European agriculture, hand or modified hand equipment is still popular. Some of the most fundamental work on application equipment is being done by Pest Control Ltd., where designers, engineers, and entomologists are working together to improve the ultimate product, keeping in mind safety devices to protect the individual using the equipment. Although the U. S. may be further along in equipment design and field application than European workers, this is not true in the field of fundamental insecticide chemistry.

World trade is at best a complicated business and probably an entomologist should do no more than to observe that American products are appearing on the Continent through regularly established channels of trade, and through manufacture on the Continent in American-owned factories. The dollar situation is an effective barrier to large scale shipments to areas that otherwise might like to have certain of our materials. One development that came to our attention at the Congress is the program of the Battelle Institute of Columbus, Ohio, under the direction of Dr. K. Starr Chester, to open several research laboratories on the Continent for the evaluation of agricultural chemicals under field conditions on a contract basis. This may provide for exploratory work for firms wishing to know more about the performance of their products before getting deeper into the foreign market.

Scientists working at the European and English Universities are spending much more time on basic research in entomology than on applied aspects of pest control. The men they turn out are well trained in fundamentals. It is largely up to the farmer to get his control information from a company which will render the service, or from industrial representatives, or from bulletins of the government research stations, as mentioned earlier in the paper.

In considering areas outside of the United States, one must take note of the rapid progress that is being made in Canada. Even though a friendly boundary separates our two great nations, the pests and control problems overlap. The recent decision of the Canadian government to support basic research in the field of pesticidal chemicals is well illustrated by the construction of the new Science Service Laboratory at London, Ontario, with Dr. Hubert Martin as head of its staff. America should profit materially from this work in the future. Similar research

"The Peak of Perfection for Crop Protection"
COPPER SULPHATE
NICHOLS
TRIANGLE BRAND
PHELPS DODGE REFINING CORPORATION
40 WALL ST NEW YORK
Copper Sulphates
for Sprays • Dusts • Fertilizers
For over sixty years Triangle Brand Copper Sulphates in various forms have been the standard of quality for agricultural chemicals.
In the preparation of Bordeaux Mixture sprays the new method using Triangle Brand 'Instant' Copper Sulphate 99% pure has superseded the old formulations. Requiring no need of a stock solution, the "Instant" form may be added directly to a Chemically Hydrated lime which need not be slaked.
Dusts are most effective when prepared with Triangle Brand Basic Copper Sulphate and the proper diluent. No lime is necessary. Concentrations of from 7-10% copper can be maintained.
Fertilizers with Triangle Brand Copper Sulphate added in their formulation will provide the necessary amount of this element vital to better crops.
Triangle Brand Copper Sulphate is available in Large and Small Crystals, Superfine (new snow form), and the 'Instant' (powder) forms which contain 25.2% metallic copper. Triangle Brand Basic Copper Sulphate is available in powder form (average particle size is 2 microns) and contains 53% metallic copper.
PHELPS DODGE REFINING CORP.
40 WALL ST., NEW YORK 5, N. Y. • 230 N. MICHIGAN AVE., CHICAGO, ILL.

Product Liability

Are you aware of the liability risk of your agricultural chemicals? Do you know that these risks can be reduced?

As an exclusive service to its members, NAC Association is conducting exhaustive studies in regard to this problem and is submitting information to its members which aids them materially in reducing their risks.

The progress of this program has been notable during the past two years, especially, and has proved itself not only helpful, but invaluable as an aid in proper administration of the sale and distribution of pesticides.

Make this valuable service available to your company by applying for a membership in NAC Association immediately.

NATIONAL AGRICULTURAL CHEMICALS ASSOCIATION

910 SEVENTEENTH STREET, N. W. WASHINGTON 6, D. C.

in forest pest control, insect pathology and biological control are of fundamental and probably equal importance.

In many areas of the world a program of education and development must precede any widespread use of pesticides. In addition to the excellent jobs being carried out by individual companies in areas of their business interest, we have seen the development of several programs which are fulfilling part of this need. At the international level, the Food and Agriculture Organization of the United Nations and the World Health Organization of the U.N. are conducting programs in agriculture and public health which in addition to relieving immediate problems, are training leaders in their own countries to carry on the work. Many missions have used American scientists to aid in the U.N. program.

In addition, students from many foreign countries are coming to American universities and laboratories for training. These men and women really offer the best link for permanent progress when they return home. Our Point Four Program under the MSA is recruiting entomologists and others interested in pest control to carry out educational and control work in foreign areas.

Similarly, the Office of Inter-American Affairs and the Office of Foreign Agricultural Relations are sending our scientists abroad, particularly to Central and South America for research, teaching and extension programs. Fulbright, MSA and foundation grants are making possible exchange of scientific personnel from all areas of the free world. The fast moving pace makes it difficult for any one to keep abreast fully of the potentialities of these diverse programs.

Yet if our industry is interested in the future of the potential markets abroad, there is every reason to keep in the picture. We are paying out of our national budget for much of the technical and developmental work of the programs mentioned. We will have keen competition from other countries as the pesticide markets grow. I hope that we are doing the planning, the coordination of information that is necessary today for good markets tomorrow.

Summary

(1) There is an extensive program of fundamental and applied research in the field of crop protection underway in England and Europe. We have profited materially from this development, and have in turn contributed to it. We definitely have entered world-wide consideration of pest control through the use of chemicals. Scientific workers today have a great opportunity for the exchange of information, ideas, experiences and inspiration.

(2) Technical missions from various agencies of national and international organizations are carrying trained personnel, materials and equipment abroad to work on pest

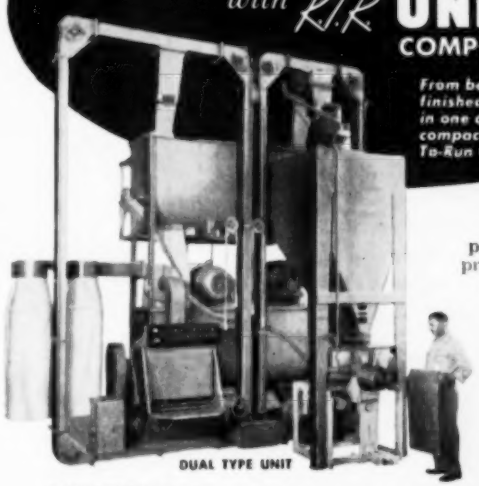
you too can improve your

insecticide production

*with R.T.R.** **UNI-BLENDER COMPOUNDING PLANTS**

From base materials to finished product in one complete, compact, Ready-To-Run Unit.

***R.T.R.— Ready-To-Run** U. S. Pat. No. 2,591,721



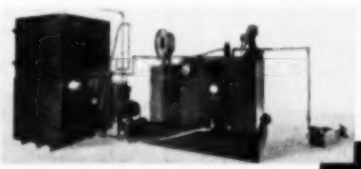
DUAL TYPE UNIT

Many of the largest insecticide producing companies and smaller processors alike have substantially increased production, improved quality and reduced production costs with these factory-tested units. These Ready-To-Run plants mix, blend and package dry, free flowing, powdered materials, including many formulas involving liquid impregnation.

DUAL TYPE: Performs three processes of production: 1) Mixes, blends and packages dry, free-flowing powdered materials. 2) Compounds finished products from ingredients requiring reduction in particle size. 3) Compounds finished products from ingredients involving liquid impregnation.

STANDARD TYPE: Mixes and blends dust concentrates with diluents to produce and package field strength insecticides of consistently uniform superior quality.

Both Dual and Standard Units handle 40 cu. ft. batches



R. T. R. Uni-Blender Liquid Formulating Plants provide for liquefying, blending and injection of specific technical grade toxicants required for the formulation of numerous concentrates and liquid spray chemicals.

Write today for technical bulletins CP-310 and LF-110.

ENGINEERS AND MANUFACTURERS

Materials processing and materials handling equipment

Poulsen

A. E. POULSEN AND COMPANY

Established 1939

3305 EAST SLAUSON AVENUE, LOS ANGELES 58, CALIFORNIA

No. 6748 *A. E. Poulsen and Company*
For Entoma Yearbook,
The Mayers Company, Inc., *Advertising*

housewives demand...

Fertilizer manufacturers have discovered that their customers like Mente Dainty Print Bags! And no wonder! They make strong, sturdy, attractive bags—and the yardage obtained (over a yard in every bag) is prized by thrifty housewives for making all sorts of pretty things for the family and home.

Band or spot labels, and both can easily be removed because of the special adhesives used.

Cotton bags are easy and quick to handle and stack—do not crack or puncture easily—can be stored safely in any temperature—have definite re-use and re-sale value.

For latest quotations, phone, wire, or write
Dept. H-3

MENTE & CO., INC.

Box 1098 Savannah | Box 690 New Orleans | Box 204 Houston

Manufacturers of

AGRICULTURAL INSECTICIDES

Methyl Bromide

(with 2% chloropicrin on option of buyer)

Packed in cans or cylinders. 1 lb. cans may be supplied with standard label or, at request of purchaser, with customer's own label.

Cylinders available in sizes of 400 lbs., 170 lbs., 120 lbs. and 50 lbs. All cylinders on deposit basis.

Terms — For accounts of established credit, sight draft terms may be arranged.

1 lb. cans packed 48 in steel strapped cartons palletized, approximately 30 cartons on each pallet. Carton weight gross, 60 lbs.; net, 48 lbs.; legal weight, 56.2 lbs.; cubic measurements, 1.17 cu. ft.

Also These EDCO Specialties

DDT
- Emulsion
- Emulsifiable Concentrate
- Wettable Powder
- Dust Base

ALDRIN
- Emulsifiable Concentrate

PARATHION
- 25% Emulsion
- 25% Dust Base
- 15% Wettable Powder

BHC
- 12 Gamma
- 36 Gamma

TEPP-40
- Tetraethyl Pyrophosphate

DIELDRIN
- Emulsifiable Concentrate
- Dust Base

TOXAPHENE
- 40% Wettable Powder

LINDANE

Direct all inquiries to:

EDCO CORP.

Elkton, Md. United States of America

Cables: "Edco", Elkton

control problems. Many of these specialists are from our own institutions. Students are coming from other lands to study in our institutions, as well as those in England and on the Continent. Through them we have an opportunity to spread sound practices in crop protection.

(3) American industry will have real competition in the expanding markets for pesticides. Those firms that are interested will need to keep their products in the foreign field for evaluation and performance study. Wherever possible, properly trained local personnel can be used to advantage; through technical and sales literature, preferably in the language of the country, education will go forward.

(4) Much information can be had by pulling together the data from various foreign programs. Perhaps the agricultural attaches at our embassies can be of help in specific areas.

(5) The opportunity for pesticides to serve mankind is broadening daily. With increasing signs of resistance on the part of the pests to these chemicals, as well as the destruction of certain of our beneficial species, there will be a constant demand for new pesticides. Development of synthetic insecticides of selective nature is opening a new field of insect control.

(6) With the ever broadening scope of our operations in agricultural chemicals, international meetings from time to time afford an opportunity for exchange of information and for personal acquaintance that will help guide the over-all program along lines of service and progress.

(7) It is evident from work abroad that all resources of science are being directed in an integrated fashion toward fundamental and applied research in the broad field of crop protection.★★

•

Klein to Sunland, Fresno

Hugo Klein, recently appointed sales manager of A. E. Poulsen & Co., Los Angeles, has resigned to accept the position of general superintendent of Sunland Industries, Inc., Fresno, Calif.

The story of Mr. Klein's having joined Poulsen appeared on page 97 of our March issue.

SIDELIGHTS

(Continued from Page 33)

Two companion culinary notes: Jack Brunton was introduced to a New Orleans novelty in a form of a chili sandwich which consists, as the name indicates, of copious quantities of unvarnished chili on a roll. Mercer Rowe on the other hand, was spotted just before plane take-off time in the airport lunchroom soaking up a piece of black bottom pie accompanied by a glass of, — yes milk! Which twin has the ulcer?

• • • •

Rumor has it that Chicago is being considered for the spring meeting in '54 and perhaps St. Louis in '56. This leaves '55 open, at least for the time being, and the cheers of course, are for a return to one of the Southern sites, — Tampa, Miami, Gulf Port or Sea Island.

• • • •

John Van Geluwe came up with the following gem. It may be safe to

for handy reference...

HANDBOOK OF

AGRICULTURAL PEST CONTROL

by

Stanley F. Bailey
Professor of Entomology, U. of California

Leslie M. Smith
Associate Professor of Entomology, U. of California

192 Pages

A PRACTICAL handbook of agricultural pest control, designed for use by the custom sprayer, the pest control operator, farm advisor, agricultural chemical salesman, county agent and field worker. This handbook covers the agricultural chemicals (insecticides, fungicides, herbicides, plant hormones, nutrient sprays, defoliants, etc.), their rates of application, useful formulas, as well as chapters on fumigation, spray machines, toxicology, dusts and dusting, aircraft, and mosquito control. Use the coupon below for your copy now!

CONTENTS

The Commercial Agricultural Chemicals
Physical and Chemical Properties
Compatibility
Containers
Fumigants and Fumigation
Toxicology and Residues
Spray Oils and their Properties
Spraying Machines
Rates of Delivery of Spray Machines
Rates of Application for Sprays
Dusts and Dusting
Aircraft
Mosquito Control
Hazards
Miscellaneous Topics
Tables and Formulas
Terms and Symbols

Send Check with Order

TEAR OFF AND MAIL

INDUSTRY PUBLICATIONS, INC.
175 Fifth Ave.
New York 10, N. Y.

Enclosed is our check for $3.25 (Foreign and Canada $3.75) covering a copy of HANDBOOK of AGRICULTURAL PEST CONTROL. It is understood that we may return the book within ten days for a full refund.

Company .....

ADDRESS .....

BY .....

MERCUSOL SEED-PROTECTANT

the only *Emulsifiable Fungicide* containing ORGANIC COPPER and MERCURY

proven an effective fungicide against SEED and SOIL borne diseases

6 EXCLUSIVE ADVANTAGES OF MERCUSOL

- The only ORGANO-METALLIC compound
- Free-flowing homogeneous liquid emulsifiable concentrate
- Forms STABLE emulsions—instantly
- Extremely small particle size assures coverage and stronger adherence
- Applicable by spraying, dipping and slurry treater
- Safe for storing in closed containers

TESTED IN THE UNITED STATES AND CANADA

Send for complete information about "Mercusol-the Organo-Metallic Fungicide"

HLW H. L. WOUDHUYSEN & ASSOCIATES DIGBY 4-1857

Factory at Long Branch, N. J. 17 BATTERY PLACE • NEW YORK 4, N. Y.

For ammonium sulphate you can count on Koppers!

Koppers offers a good commercial grade of ammonium sulphate—the ingredient that is so essential to fertilizer because of its high nitrogen content.

CHARACTERISTICS— Koppers Ammonium Sulphate comes in crystals with low free-acid and moisture content. The nitrogen content is guaranteed to be not less than 20.5%.

SHIPMENT— From St. Paul, Minn. and Kearny, N. J., Koppers Ammonium Sulphate is shipped in 100 lb. and 200 lb. bags—also in boxcars and trucks. From Granite City, Ill. and Midland, Pa., it is shipped only in boxcars and trucks.

KOPPERS **COAL CHEMICALS**

KOPPERS COMPANY, INC.
Tar Products Division, Pittsburgh 19, Pa.

NAC Group Visits Sulfur Installation

Left to right: Roger Gunder; Dr. H. L. Haller; Charles Hovey; I. J. Becnel; Dr. Charles E. Palm; Dr. P. D. Peterson; R. R. Young (Freeport guide); and W. H. Prigmore, on dock at Freeport's Grand Ecaille mines near New Orleans.

run it now that all expense accounts from the meeting have presumably been audited and paid.

She was "Honey Chile" in
New Orleans,
The hot-spot of the bunch,
But on the old expense account
She was "gas, cigars and lunch".

* * * *

Old Man River attracted attention of many conventioneers at odd times, with excursions up and down the Mississippi being a popular diversion. The steamer President probably carried more of the insecticide trade than most of its creditors!

* * * *

An informal trip to Freeport Sulphur Company's Grande Ecaille mines not far from New Orleans was taken by a group on Friday afternoon. With I. J. Becnel, director of agricultural research for the company as host, the group motored to Port Sulphur, La. and from there rode in company launches to the mine site.

The group included Dr. H. L. Haller, assistant chief, Bureau of Entomology and Plant Quarantine, U. S. Dept. of Agriculture, Washington, D. C.; Dr. Charles E. Palm, Cornell University, president of the Entomological Society of America; Charles Hovey and W. H. Prigmore of Eastern States Cooperative, Springfield, Mass.; Dr. P. D. Peterson, Stauffer Chemical Co.; Roger Gunder, Montrose Chemical Corp. of California; and a representative of Ag. Chem.

Freeport's power plant was visited, the wells inspected and control rooms explained by the company's production engineer, R. R. Young who described the Frasch method of mining.

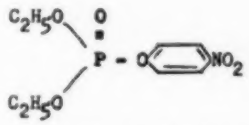
* * * *

The NAC board of directors was entertained at lunch on the final day of the meeting, at the famous International House. The meeting, an informal one, was supposed to be preserved for posterity through a photograph, but sadly, conditions for taking a good picture were adverse and our camera-shooter reports that his efforts failed to come out well on this one! Our apologies to Pete Petrus and Fred Hatch, who acted as hosts at the affair.

SYSTEMICS

(*Continued from Page 50*)

The most active compound of this class is:



Diethyl *p*-nitrophenyl phosphate (para-oxon) (31)

Para-oxon is approximately as effective as Systox in nutrient-solution tests, and more effective on cotyledonous plants following seed treatment. However, as pointed out above, the true leaves of plants grown from treated seed are not effective against mites and aphids, and the compound is not translocated following foliage application. David and Gardiner (1951) have also stated that para-oxon is not translocated following application to the foliage, or to the intact root. Moreover, para-oxon is extremely phytotoxic at all dosage levels that are insecticidally effective.

Other compounds of this class that exhibit systemic activity of a limited sort are parathion; dimethyl

LUNG and EYE
protection
FOR AGRICULTURAL CHEMICAL WORKERS

RESPIRATORS
AGRISOL
Parathion, Aldrin, Toxaphene, etc.
Agri-Tepp
tepp, hetp
U.S.D.A. tested

Comfortable, efficient protection for light concentrations of insecticides.

No. 25 DUST RESPIRATOR—a filter respirator for protection against *non-toxic* dusts.

Gas Masks

Lightweight, easy-to-wear full-face protection for heavy concentrations of insecticides. Types for all hazards. State material being used.

MonoGoggle®
Lightweight, all plastic eye protection for handling chemicals and for impact hazards.

Don't take chances—keep on the safe side—use agricultural protective equipment by Willson. Write for literature and colorful agricultural safety poster.
®TRADE MARK

WILLSON®
WILLSON PRODUCTS, INC.
Established 1870
116 Thorn St., Reading, Pa.

For Better Protection against Pests use these

PRENTOX *PEST-TESTED*

BASIC INSECTICIDE CONCENTRATES

DDT—Wettable and Dry Powders; Oil Concentrates; Emulsifiable Concentrates

CHLORDANE—Oil Concentrates; Wettable and Dry Powders; Emulsifiable Concentrates

ROTENONE—Derris and Cube; Powdered Concentrates

SABADILLA—Ground Seed; Dust Concentrates

TOXAPHENE—Wettable Powders; Dust Concentrates

LINDANE—Wettable and Dry Powders; Oil Concentrates; Emulsifiable Concentrates

PYRONYL CONCENTRATES—Piperonyl Butoxide-Pyrethrum Concentrates for Space Sprays, Livestock Sprays and General Pest Control

PYRETHRUM—Powder; No. 20 Extract

RAX POWDER—A rodenticide Containing 0.5% Warfarin

For information on Any of These PRENTOX Pesticide Concentrates Write to

PRENTISS DRUG & CHEMICAL CO., Inc.

10 William Street, New York 7, N. Y.

9 South Clinton Street, Chicago 6, Ill.

Now **3** COMPANIES *To Serve The West*

UNITED CHEMICAL COMPANY

Serving THE RESELLER

Complete Line of Agricultural Chemicals

Heckathorn AND COMPANY

Serving MANUFACTURERS and FORMULATORS

Complete Manufacturing And Packaging Facilities

AGRICULTURAL CHEMICALS SERVICE CO.

Serving THE FERTILIZER RESELLER

Fertilizers-Simples and Mixes Liquid and Dry

And **7** OFFICES

641 South Fourth Street • LAndscape 5-9210

RICHMOND, CALIFORNIA

SACRAMENTO • BAKERSFIELD • TULARE • FRESNO • POMONA

YAKIMA, WASHINGTON

parathion; O-methyl O-isopropyl O-*p*-nitrophenyl thiophosphate; O-methyl O-*n*-propyl O-*p*-nitrophenyl thiophosphate, and O-methyl O-*n*-butyl O-*p*-nitrophenyl thiophosphate. Each of these was less phytotoxic than para-oxon, but all caused plant injury at dosages required for systemic effect.

It is thought that the type of translocation that occurs with this group of compounds differs from the activity of the preceding groups in being more local and perhaps purely mechanical in nature. Perhaps this type of compound never moves far from the larger vascular elements. Limited movement would account for failure of these compounds to kill aphids and mites on the true leaves of cotton plants grown from treated seed, and explains why gross-feeding insects on these same leaves are killed.

Discussion

Two types of systemic action have been found to occur in these phosphorus compounds. In one type, characterized by compounds related to para-oxon, the translocation is local and is possibly purely mechanical. In the second type the insecticide applied to any part of the plant is translocated to all parts of the plant, and treated plants may remain toxic to insects for several months. This type of systemic action is of greater interest in the control of aphids and spider mites.

Compounds exhibiting the second type of systemic action have been found to be acid anhydrides of substituted phosphoric acids having potential sites of enzymatic association as a part of the anhydride linkage. Acid anhydrides are powerful acylating agents. It seems probable that compounds containing certain groups may form molecular complexes with plant enzymes or other plant constituents. Following ingestion by an insect of plant sap containing the molecular complex, the acid anhydrides convey a substituted phosphoric acid residue to a vital insect enzyme and attach it to a site normally occupied by an unsubstituted phosphate.

The key, then, to whether or not a given toxic phosphorus compound possesses systemic action of this type lies in the nature of the association site of the anhydride linkage. In this article seven such sites are discussed; others may be found as this work is extended. Compounds with these seven types of anhydride linkage obviously are only a few of the potentially active systemic compounds. Many other toxic phosphorus compounds exhibit no systemic activity whatever. They would include compounds having as part of the anhydride linkage saturated, unsubstituted aliphatic or aromatic groups, or these groups containing NH_2,SO_3, COOH, Cl, OH, CO, and OCH_3.

Reference Cited

David, W. A. L., and B. O. C. Gardiner. 1951. Investigations on the systemic insecticidal action of sodium fluoroacetate and of three phosphorus compounds on *Aphis fabae* Scop. Ann. Appl. Biol. 38(1): 91-110.

Franke, K. W., and A. L. Moxon. 1936. A comparison of the minimum fatal doses of selenium, tellurium, arsenic, and vanadium. Jour. Pharm. and Exptl. Therap. 58: 454-459.

Hartley, G. S. 1951. Chemistry of systemic insecticides. 7 pp. Pest Control, Ltd., Cambridge, England.

Ivy, E. E. 1952. Testing systemic insecticides. Ag. Chem. 7(11): 44-45, 121, 123.

Ivy, E. E., Wm. Iglinsky, Jr., and C. F. Rainwater. 1950. Translocation of octamethyl pyrophosphoramide by the cotton plant and toxicity of treated plants to cotton insects and spider mites. Jour. Econ. Ent. 43(5): 620-626.

Metcalf, Robert L., and Ralph B. March. 1949. Studies of the mode of action of parathion and its derivatives and their toxicity to insects. Jour. Econ. Ent. 42(5): 721-728.

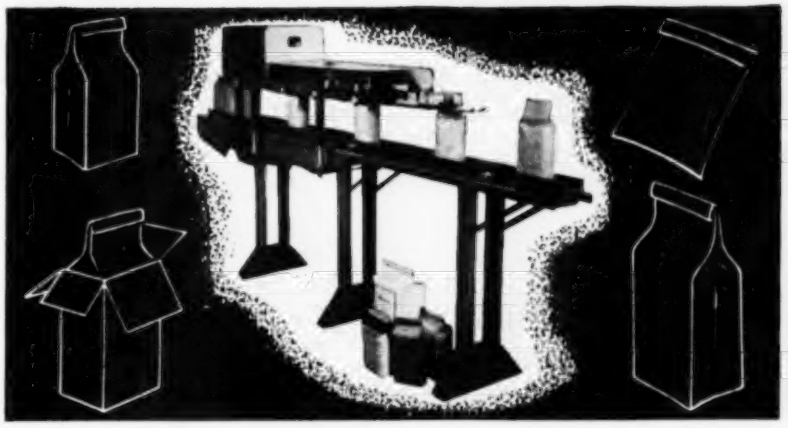
Schrader, G. S. 1951. Die Entwicklung neuer Insectizide auf Grundlage organischer Fluor- und Phosphor-verbindungen. Monograph No. 62, 62 pp. Verlag Chemie, G. M. B. H., Weinheim, Germany.

FERTILIZER SIGNS

(*Continued from Page* 41)

straw and grain on the fertilizer section of the field. This is the type of record that impresses neighboring growers. (*Continued next page*)

FRY BAG SEALER



Makes Sift-Proof Seals in Heavy Weight Paper Bags

Fry Model CSG automatically makes a double folded sift-proof heat seal in the top of any heavy weight paper bag. The first fold is securely heat sealed; the second is glued for extra safety.

Bags handled include polyethylene and pliofilm lined, polyethylene coated and those with thermoplastic top sealing bands. Simple adjustments for bags of various heights. This model also handles bags which are not heatsealable by gluing the folds.

Machine above is perfect for granular or fine products such as insecticides, chemicals, powdered paints, fertilizers, dog foods, etc.

Other models available . . . when writing, please submit a sample of your bag and your product.

GEORGE H. FRY COMPANY 42 East 2nd St. Mineola, L. I., N. Y. GArden City 7-6230

MAGNESIUM SILICATE **ALUMINUM SILICATE**

FOR INSECTICIDES USE

TALC

Guaranteed Dryness Controlled pH.

The Ideal Filler & Diluent

EASY DUSTING
(Softness, Slip, Clingability, Dry)

AIR FLOATED
(Up to 99.5% 325 Mesh)

PACKED IN 50 LB. PAPER BAGS — AVAILABLE IN CARLOAD OR TRUCK LOAD LOTS

SAMPLES UPON REQUEST

GEORGIA TALC COMPANY, INC.

CHATSWORTH, GEORGIA

P. O. Drawer 278 Incorporated 1907 Phone 4431

PROMPT SHIPMENT AT ALL TIMES

for specified performance . . .
and performance as specified

TeeJet SPRAY NOZZLES

For effective spraying and lowest chemical costs TeeJet Spray Nozzles provide uniform spray pattern, exact spray type, and precision capacity. Performance specified in TeeJet bulletins and data sheets tabulates the exact kind of performance each nozzle will give. You can dependably follow nozzle specifications in selecting TeeJet Spray Nozzles to meet the requirements of all equipment and chemicals.

INTERCHANGEABLE ORIFICE TIPS

Over 400 interchangeable orifice tips . . . a type and capacity for every farm need. For weed control, pre-emergence spraying, insecticides and related applications.

Flat spray, cone spray, and straight stream . . . all capacities.

RELATED EQUIPMENT . . . wide range of related equipment such as BoomJet for single nozzle broadcast spraying in patterns up to 66 feet wide . . . GunJet spray guns for spraying trees, cattle, and scrub growth . . . and strainers, connectors and fittings.

For Complete Information . . . write for Bulletin 58

SPRAYING SYSTEMS CO.
3230 Randolph Street • Bellwood, Illinois • USA

WISCONSIN ALUMNI RESEARCH FOUNDATION

LABORATORY SERVICES

Peet-Grady and C.S.M.A. aerosol tests

Biological evaluation of insecticides

Screening of compounds for insecticidal, fungicidal, and bactericidal properties

Bioassay of insecticide residues on crops

Chemical determination of insecticides

Phenol coefficient determinations

Mineral determinations including fluorine and other trace elements

Warm-blooded toxicity studies

Warfarin assays — physico-chemical and biological

Other biological, chemical, and microbiological services

Project research and consultation

Write for price schedule

WISCONSIN ALUMNI RESEARCH FOUNDATION

P. O. BOX 2059 • MADISON 1, WISCONSIN

Commenting upon the benefits accrued from the sign investment, Mr. Andrew declares that it was a good advertising idea, especially, since aggressive fertilizer salesmanship in the state of Iowa had been the exception rather than the rule. "It is of great value to the local dealer to have his name on the sign, too!"

Of even more importance, it is pointed out, such projects may be used in demonstrational-educational programs by fertilizer manufacturers and dealers to point out the results of good fertilization. The sign can tell the passing farmers a better story if an unfertilized strip is left in the field for comparison purposes.

The soil fertility problem in Iowa, as in other states, is greater than many people realize. Certainly, the fertilizer educational programs have not reached nor convinced all of the farmers. The simple act of placing signs on fertilized plots is a means of reaching more farmers and making them fertilizer conscious.

HOUSEKEEPING

(*Continued from Page 36*)

laneous items so that it will take quite a while to determine the location and a longer time yet to move the tangle of other parts to pull it out?

Tools will be needed in a hurry for a job of this character. Are they immediately accessible without loss of time hunting for them?

Exaggeration? Not at all. These are things that can happen any time in many fertilizer plants, and they serve to illustrate how these aspects of housekeeping affect the overall cost of maintenance and also affect the cost of production. It is a sad day for any company when production crews must stand by idly while repairs are made . . . but an even sadder time is seen when the down time is extended needlessly.

Flimsy Guards Costly

GUARDS around moving belts or gears are a recognized necessity when such hazards are within reach of employees. But sometimes such guards appear to be mere gestures toward the safety ideal, rather than honest-to-goodness protection for the workers. Here is an electric motor drive pully, for instance, being "protected" by a shaky arrangement of 1 x 3 strips. One of these strips will get broken, and someone will repair it as best he can. Soon, another strip is split, but this time a longer time elapses before the repair is made. Still another strip breaks, but before it is fixed, it is necessary to remove the guard to grease the motor. Upon noting the inadequacy of the little strips, the workmen shrug their shoulder and decide not to bother with putting them back. "What's the use?" they ask themselves. "They're broke all the time anyway." So they walk off and leave it thus and soon there's an accident.

The fault is largely one of attitudes. The guard in the first place was insufficient to command respect of the workers who knew that it wasn't put there to guard the machinery as much as it was meant to satisfy the requirement for some kind of protection around moving machinery. If a proper, substantial guard had been provided in the first place, the maintenance crew would realize that there was a purpose in its use and there would have been no inclination to disregard replacing it after completing their work on the motor.

Fire Protection

IT goes without saying that management is interested in protecting its capital investment against fire and other hazards. Yet, insurance rates are high for fertilizer plants and even so, many insurance companies are reluctant to assume the risk. Poor housekeeping can increase fire hazards to the point where losses in the industry would increase premiums even more.

That high rates are unnecessary is indicated by the records made by many plants whose management is careful about details such as house-

PYROPHYLLITE

the ideal Diluent and Extender for INSECTICIDES

Eliminate the "Bridging over" in your blender, use Insecticide Grade Pyrophyllite

Ask For Our Pamphlet

GLENDON PYROPHYLLITE COMPANY

P. O. Box 2414, Greensboro, N. C. Plant and Mines at Glendon, N. C.

Formerly Glendon Div., Carolina Pyrophyllite Co.

PIONEER PYROPHYLLITE PRODUCERS . . now offers

"PHYLLITE" And "STONE MEAL"

(Trade name) (Trade name)

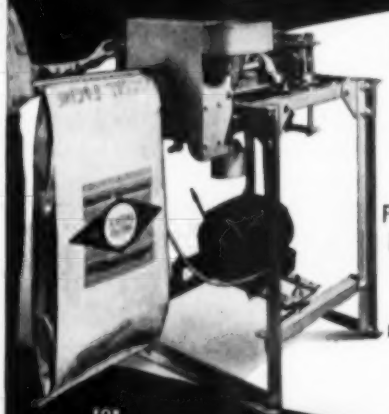
World's greatest diluent and carrier is non-abrasive, uniform and adheres readily to foliage. It is ground in a Raymond mill — 95% through 325 mesh and has a low pH of 5.1. Phyllite is packed in 50 pound valve bags, 20 ton lots lowest prices on the west coast, fob plant.

16% organic potash with trace minerals. Immediately available in bulk or sacks. Write us for helpful information and a generous sample. Expansion to new Campo, Calif. plant will increase our production to 300 tons a day.

Chula Vista, Calif - P.O. Box 686 - Hancock 2-2992 (Los Angeles Phone Texas 0-3442)

Investigate the 1953
BLACK DIAMOND AUTOMATIC

valve bag packer



Designed to pack dry granular or powdered free-flowing materials

★

Push-button control
Moderately priced
Easy to install
Lowest maintenance costs
Performance guaranteed

★

FOR FURTHER INFORMATION WRITE **BLACK PRODUCTS COMPANY** TO 13513 S. CALUMET AVE. • CHICAGO 27, ILL.

MANUFACTURERS SINCE 1912

Potassium Nitrate

A quick soluble source of Potash and Nitrogen for use in the preparation of concentrated water soluble fertilizers or starter solutions.

Our private formula service is available for the preparation of water soluble fertilizers under your own label.

Davies Nitrate Co., Inc.

114 Liberty St. New York 6, N. Y.

Plant at Metuchen, N. J.

DOLOMITIC LIMESTONE

ANALYSIS GUARANTEED

. . . 60% Calcium Carbonate
. . . 39% Magnesium Carbonate

WILLINGHAM-LITTLE STONE COMPANY

1201-4 Healey Building, Atlanta 3, Ga.

"38 Years Service to the Fertilizer Industry in the Southeast"

keeping. One of these important details is that of electrical wiring . . . a hazard which should never be underestimated.

Inspection trips through fertilizer plants reveal startling irregularities in the placement of light bulbs; the stringing up of extension cords; the inexpert installation of new wires and cables.

Even minor alterations, such as relocating a 100 or 200-watt bulb, may have surprising results. Perhaps the glare of such a light annoys the operator of a weighing machine, so he moves it back of him by tacking the extension against the wooden casing of an elevator. It's just a small bulb, and what trouble could it cause?

When one finds places where spots three to four inches in diameter have been charred up to a half inch deep by these "harmless" bulbs, it is realized that any one of these spots, under the proper atmospheric conditions, could have caused a fire sufficient to destroy the plant. Several of these have actually started fires, which fortunately were discovered in time to quench.

At other times, workmen seem to delight in rigging up extensions. Perhaps the fellow in the weigher's booth desires more light and decides to run a cord through the wooden top of the booth for that purpose. But he is a cautious man, realizing that it might be bad to allow the cord to contact boards, so he inserts a short section of pipe into a hole bored in the ceiling and carefully runs the cord through the pipe to be sure there is no contact with the wood.

Soon the rough edge of the pipe at the lead end, with the help of plant vibration, wears off the insulation until a partial short circuit develops, not sufficient to cause a fuse to blow, but enough so that an almost constant arc of very high temperature is caused. The pipe may dissipate the heat before it reaches the wood, or it may not. At any rate, the insulation can catch fire and ignite other combustible material near by.

For the purpose of controlling a fire in its early stage, the worth of fire extinguishers can hardly be overrated. But once under way, a fire of the type common to fertilizer plants will pay little heed to the efforts of a hand extinguisher. Thus, the opportunity for use of this equipment is short-lived, but of utmost importance. That extinguishers must be readily accessible and ready for instant use is too obvious to dwell upon; yet in many plants where housekeeping has been allowed to deteriorate, extinguisher racks are sometimes found empty. Just where is the extinguisher?

A brief search will reveal it . . . but even a brief search when a fire is getting started, is too long. The missing extinguisher may be found almost anywhere . . . stuck around the corner behind a post; lying on the floor; behind a stack of bagged fertilizer; just any place . . . it doesn't seem to make a great deal of difference in a plant where it is too much trouble to be orderly.

Where must the initiative for orderly maintenance begin? One thing is certain: it will never start with the laborer and filter up through the foreman to the superintendent! It must start in the superintendent's office and go from there to the foreman and from him directly to the rank and file of labor.

Perhaps the best way to get the point across is for the foreman's office itself to be a worthy example of tidiness and efficiency. Here, no extension cords should be strung around the place to supply power for lamps, clocks, adding machines, etc. Nor should there be a disorderly stack of record books piled in the corner or on the desk. The desk, filing cabinets and other pieces of furniture should be reasonably free of dust . . . certainly not evidencing the accumulation of years. In other words, the whole quality of the housekeeping program must be set by the superintendent in both word and deed. He must lead, with the workers following the example. The stakes are high . . . the effort for greater freedom from accidents is well worth while ★★

EMULSION FORMULATORS!

Save Money on "Packaged" Equipment by
— Young Machinery Company

Formula Applications

HOT: DDT, TDE, BHC, Heptachlor, and other materials which are solid at room temperatures and must be melted to achieve volume output. Toxaphene high rate melting attachments are available.

The Hot System is complete with steam jacketed melting and mixing kettle and electric or fired boilers.

COLD: Chlordane, Parathion, Aldrin, and other materials in liquid form or materials in solid form which melt in the presence of solvents under agitation.

Capacities (gallons per batch)
150 — 250 — 500 — 750 — 1000

Construction (compact)
Single frame, separate mixing and storage tanks combined with complete integral pump and piping. Non-corrosive materials are utilized where necessary. Propeller agitators are used in conjunction with pump recirculation agitation. Packaging line filter is included. Solvent meters are available.

Price

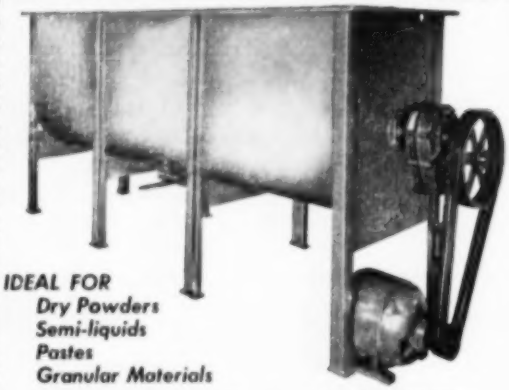
Single Tank System	from $1050.
Dual Tank System	from $1600.

Write:

YOUNG MACHINERY CO.
MUNCY, PA.
for details!

Depend on **RODGERS**

BLENDERS and BATCH MIXERS



IDEAL FOR
Dry Powders
Semi-liquids
Pastes
Granular Materials

- EASY TO CLEAN • BALL BEARINGS
- SPECIAL DESIGN PACKING GLANDS
- DUST-TIGHT • LEAKPROOF • WATERTIGHT

We are also manufacturers of Agitators, Kettles, Powder and Paste Fillers . . . We can build to specifications to fit your special requirements!

REQUEST CATALOG N 43

GEORGE G. RODGERS CO. Inc.
2401 THIRD AVE. • NEW YORK 51, N. Y.

MODERN REBUILT & GUARANTEED EQUIPMENT

UNION Rebuilt Machinery Established 1912

At Great Savings

International Stainless Steel Straightline Vacuum Filler.
Resina Model LC automatic Capper.
F. M. C. Kyler Model A adjustable Wraparound Labeler.
Mikro 4TH. 3TH. 2TH. 1SH. Bantam (Stainless Steel also) Pulverizers.
Robinson 100. 800. 1500. 10.000 lbs. Dry Powder Mixers.
Day 650 gal. Steam Jacketed Jumbo Mixer.
Allis Chalmers and Great Western V. C. B4. B6 Jumbo Sifters.
Stokes and Smith Model A Transwrap Filler.
Stokes and Smith G1. G2. G6 Auger Powder Fillers.
Stokes and Smith Model HG38 Duplex Auger Powder Filler.
Pony ML and M Labelrites: Ermold and World Labelers.
Oliver automatic adjustable Wrapper, for wrapping in kraft and cellophane.
Package Machinery FA. FA2. FAQ automatic cellophane Wrappers.
Hayssen 3" - 7", 8" - 18", 7" - 13" automatic Wrappers.

IMMEDIATE DELIVERIES

Write, Wire, Phone Collect for Details and Prices On All Your Machinery Requirements

UNION STANDARD EQUIPMENT CO.
318-322 Lafayette St. New York 12, N. Y.

VELVEX

KAOLIN CLAY

For Use in Extending Insecticidal Materials

- Non-Abrasive
- Small Particle Size
- Chemically Adaptable
- Good Adhesive Qualities

For information and samples, write:

SOUTHEASTERN CLAY COMPANY
AIKEN, SOUTH CAROLINA

BROKERS

YOUR REQUIREMENTS INVITED

for

FERTILIZER and FEED MATERIALS

Kolon Trading Co., Inc.

15 PARK ROW, NEW YORK 38—BEekman 3-8820
Cable Address "KOLONOWAN" Teletype N Y 1-2083

"COHUTTA"

POWDERED TALC

An excellent carrier for insecticides and fungicides. Produced by

Cohutta Talc Co.
Dalton - - - Georgia

Classified ADVERTISING

Rates for classified advertisements are ten cents per word, $2.00 minimum, except those of individuals seeking employment, where the rate is five cents per word, $1.00 minimum. Address all replies to Classified Advertisements with Box Number, care of AGRICULTURAL CHEMICALS, 175 Fifth Ave., New York 10. Closing date: 25th of preceding month.

Situations Wanted:

AGRICULTURAL CHEMICALS SPECIALIST: Widely experienced production and sales supervision, development, technical service—insecticides, fungicides, herbicides, defoliants. Good educational background, chemistry and biology. Seeking attractive managerial or administrative position. Will consider any location. Address Box No. 728, c/o Agricultural Chemicals.

AGRONOMIST, 25: Wide field experience with herbicides. Formulated pesticides. Soils and chemical background. Prefers midwestern location in development or research. Address Box No. 731, c/o Agricultural Chemicals.

Positions Open:

OPPORTUNITY
SALES EXECUTIVE

Agricultural and Industrial Chemicals

Require man with sound business training, age 32-42 to handle position of responsibility with old established distributor of agricultural and industrial chemicals. Education and experience in agricultural chemical field plus sales and executive ability essential. Salary open. Please send complete information on education, business experience, present salary level, age, references, photo.

Box 727

TECHNICAL MAN with production experience. Established small firm manufacturing insecticides and related products for horticultural and home garden trade requires services of young man to direct production. Must be competent in chemistry and uses of insecticides and fungicides. Opportunity for advancement in salary and responsibility. Replies will be handled in confidence. Address Box No. 729, c/o Agricultural Chemicals.

EASTERN SALES DEVELOPMENT REPRESENTATIVE to introduce sale of and develop new products. New position with progressive and growing chemical company. Thorough knowledge of organic chemicals plus at least five years experience dealing with eastern chemical companies required. Chemistry degree preferred. Age: Under 45. Salary: $10,000 plus expenses. Address Box No. 730, c/o Agricultural Chemicals.

HANNA'S HANDBOOK
of
AGRICULTURAL CHEMICALS

Containing 209 pages of descriptions, uses, formulations, toxicity, and antidotes of over 500 Fertilizers, Fumigants, Fungicides, Herbicides, Insecticides, Rodenticides, and miscellaneous materials. You need this HANDBOOK for yourself, your salesmen, fieldmen, farms, homes and gardens. Price $3.25—Send orders to:

LESTER W. HANNA,
R#1, Box 210
Forest Grove, Oregon

C. C. McDONNELL, D.Sc.

Formerly Chief Insecticide Division, Production and Marketing Administration, U. S. Department of Agriculture

CONSULTANT

Insecticides, Fungicides, Disinfectants, Rodenticides, Weed Killers, Formulas, labeling, advertising and registration under the Federal Insecticide, Fungicide, and Rodenticide Act. Represent manufacturers at hearings before the Department of Agriculture.

122 Hesketh Street, Chevy Chase, 15, Md.

Carl N. Andersen, Ph.D

Consulting Chemist

Phenyl Mercury Compounds
Insecticides, Fungicides-

342 Madison Ave.
New York 17, N. Y.
Phone: VA 6-0492

Laboratory: Briarcliff Manor, New York
Phone: Briarcliff 6-1550

Theodore Riedeburg Associates

Sales Consultants
and
Manufacturers' Representatives
on
Agricultural Chemicals

415 Lexington Ave., Rm. 808
New York 17, New York
MU rray Hill 7-1488-89

FRIAR M. THOMPSON, JR.

Consultant

Specializing in insecticides, rodenticides, fungicides, weed controllers for industry, household, and farm.
Product formulation, testing, labeling.

Athens, Georgia

FLORIDA FIELD TRIALS

Evaluations
of
Agricultural Chemicals.

DR. G. R. TOWNSEND

Box 356
Belle Glade, Florida

Herbicides vs. Guerillas

The use of agricultural herbicides to halt guerrila ambushes along Malayan roads has been reported from Kuala Lumpur, Malaya. Kill-

DEADLY GRINDER • DUST TRAMP IRON AND NO DINGS MAGNETS

POWERFUL, non-electric Dings Perma-Plate Magnets should be a big safety factor in your operations. They keep tramp iron out of grinders, other processing equipment . . . eliminate the fire and explosion hazard of iron sparks.

Inexpensive Dings Perma-Plates can be installed almost anywhere in your processing flow —in chutes, ducts, over belts. Dings certifies and guarantees magnetic strength—forever. Write for Catalog C-1205-A.

DINGS MAGNETIC SEPARATOR CO.
4745 W. Electric Ave., Milwaukee 46, Wis.

DINGS MAGNETS

DINGS PERMA-PLATE MAGNET

Berkshire

SPECIALISTS in Magnesia for Agriculture

EMJEO (80/82% Magnesium Sulphate)
Calcined Brucite (fertilizer grade) 70% MgO
Calcined Magnesite 85 to 95% Mg O

POTNIT
(95% Nitrate of Potash)
for
Special Mixtures and Soluble Fertilizers
Other Fertilizer Materials

INSECTICIDES — FUNGICIDES
Mercury Compounds
for Agricultural Use

DITHIOCARBAMATES
Ferric — Zinc

EXPORT - IMPORT

Berkshire Chemicals, Inc.
420 Lexington Avenue, New York 17, N. Y.
Cable Address—"Berkskem" New York
Sales Agents for F. W. Berk & Company, Inc.

for HIGH capacity storage at LOW cost

MARIETTA concrete stave storage tanks are quickly, permanently erected in any size, any arrangement, to improve your storage operations. Provide large capacity to handle increased output, offer air-tight, moisture-free facilities that keep agricultural chemicals dry, fully protected from fire and the elements.

Let MARIETTA engineers design a modern, economical concrete storage system for you to reduce loss of stored materials, give you efficient, profitable storage and handling facilities. Write, wire or phone for their recommendations . . . TODAY!

The MARIETTA Concrete Corp., Marietta, Ohio

Branch Offices: 509 FIFTH AVENUE, NEW YORK 17, N. Y.
PULASKI HWY. at RACE RD., BALTIMORE 6, MD.

Lancaster, Allwine & Rommel
Registered Patent Attorneys
Suite 428,
815—15th STREET, N. W.
Washington 5, D. C.

Patent Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions.

Booklet and form "Evidence of Conception" forwarded upon request.

ing the high weeds in which marauders could hide has ended much of the threat from this type of attack, it is reported.

Experiments in chemical spraying were carried out by a fleet of vehicles equipped with pumps and spray gear. They have been quite successful in eliminating hiding places from which terrorists could operate.

•

Bankers Boost Fertilizer

The Ohio Bankers Association is distributing to its members a new booklet pointing out the potentials of greater fertilizer usage, expected to acquaint rural bankers in the state with farm plant food problems. Prepared in cooperation with the National Fertilizer Association, Washington, D. C. and the department of agronomy at Ohio State University, the brochure points out that if farmers learn to use the quantities of fertilizer known to be profitable on various crops, a financing problem will arise that banks, particularly those in rural areas, must be prepared to meet.

Quoting Ohio State University specialists, the booklet estimates that in 1952, the fixed costs involved in producing an acre of corn in Ohio averaged $39.00 per acre, whether production totaled 20 or 120 bushels per acre. At the same time the average value of the corn crop last year was $58.50 per acre, leaving a gross profit of $19.50.

Proper application of $10.45 worth of fertilizer would have boosted average corn yields to 59 bushels per acre, and profits to $39.05, while $20.90 worth of fertilizer would have produced an average of 75 bushels of corn per acre, and a gross pofit of $52.60.

Issuance of this publication is the latest step in a long range program being sponsored by the Ohio Bankers Association to build a more practical relationship between farmers and their community bankers, according to O. E. Anderson, secretary of the organization.

•

Woodrich Joins Chase Bag

E. M. WOODRICH

E. M. "Woody" Woodrich has recently joined the Chase Bag Company and will handle the Oklahoma territory, J. P. Falconer, manager of the Dallas office, has announced.

Mr. Woodrich attended the University of Oklahoma and was a fighter pilot in World War II. He served as a jet pilot in the Korean War and was recently discharged with the rank of Major.

•

S. W. Group Names Howell

Dr. D. E. Howell, department of Entomology, Oklahoma A & M College, Stillwater, was named Chairman of the Southwestern Branch of the Entomological Society of America at the group's recent meeting at Galveston, Texas. Other officers elected were: vice-chairman, Douglas Earley, Port Fertilizer & Chemical Co., Los Fresnos, Texas; and Sherman W. Clark, Texas Gulf Sulphur Co., Houston, Texas, secretary-treasurer.

Dr. Howell succeeds P. J. Reno, Hercules Powder Co., Dallas, Texas, as chairman; and Mr. Earley succeeds Clyde A. Bower, Oklahoma City, Okla., as vice-chairman. Mr. Clark was re-elected as secretary-treasurer.

ALVIN J. COX, Ph.D.
Chemical Engineer and Chemist
(Formerly Director of Science, Government of the Philippine Islands. Retired Chief, Bureau of Chemistry, State of California, Department of Agriculture.)
ADVISER ON AGRICULTURAL CHEMICAL PROBLEMS AND INVESTIGATIONS
Consultant in reference to spray injury and damage, claims, including imports of fruits and nuts, formulas, labeling, advertising and compliance with law.
1118 Emerson Street
Palo Alto, California

PUT YOUR OWN BRAND NAME ON PACKAGED PRODUCTS

Bring out new products under your name. Just tell us what you want to sell—we'll do the rest. Here's your chance to come out with 2,4-D weedkillers, 2, 4, 5-T Brush Killers, Chlordane, DDT formulations, and many other agricultural chemicals now in demand. Distribute them through your present set-up at *no increase in overhead.*

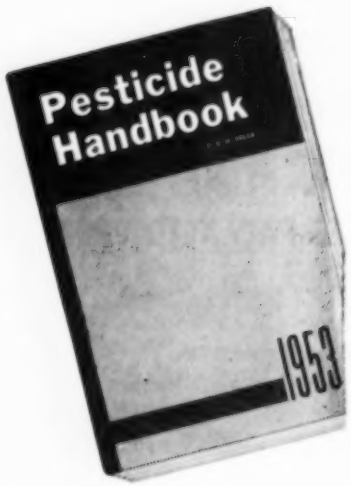
No investment necessary. You buy no equipment, hire no people, acquire no more factory or warehouse space. We do everything. We make the products, package them under your name, warehouse as necessary and ship per instructions.

Manufacturers' Overload Service. If your present facilities are overloaded, you may ship us product and containers in large quantities. We'll package and distribute for you at a nominal charge. It's the smart way to overcome freight differentials in serving the profitable Midwest, South and Southwest.

Serve America from the Heart of America

PRIVATE BRANDS, INC.
300 S. 3rd St. · Dept. AG-3
KANSAS CITY, KANSAS

Completely Revised



UP-TO-THE-MINUTE

Edition

Reporting on over

5000

Trade Names

AN IMPORTANT BOOK FOR THOSE INTERESTED IN ANY PHASE OF PEST CONTROL

County agents, extension and research specialists, manufacturers, salesmen, jobbers, dealers, purchasing agents, health officers, farmers and librarians have found this publication to be extremely useful time and time again. *Pesticide Handbook* is the ONLY book giving complete up-to-the-minute information on over 5,000 commercial products, completely indexed by trade names, active ingredients and manufacturers.

at your fingertips —

You'll find a wealth of information on fungicides, insecticides, rodenticides, adjuvants, diluents, compatibilities, antidotes, pest control equipment & professional pest control operators.

about the editor —

Dr. Donald E. H. Frear, Editor of PESTICIDE HANDBOOK 1953, is one of the leading authorities on the chemistry of pesticides. He is the author of "Chemistry of Insecticides and Fungicides," the first book dealing with this subject published in the United States. In addition, he has written several other books, including "Chemistry of Insecticides, Fungicides, and Herbicides." Dr. Frear is Professor of Agricultural and Biological Chemistry at The Pennsylvania State College.

Over 200 Pages **1.25** Postage *included*

Cloth Bound Edition ..... ea. 3.00

Send Today

PESTICIDE HANDBOOK

P. O. BOX 798

STATE COLLEGE, PENNSYLVANIA

NEW LEGISLATION

(*Continued from Page 57*)

be $4 each. The present fee is $50 and $2 per product over 10. In the case of household pesticides with less than a total retail value of $500—$15 for the first two brands registered and $4 for each additional brand. The bill has been referred to the Agriculture Committee.

Colorado House Bill 141 would amend the present provision in the pesicide law relating to registration fees of $5 for each economic poison registered up to 10 brands, and $2 each for additional brands registered. The present registration fee for pesticides in Colorado is $5 per brand with a $50 maximum.

Montana Senate Bill 94 amends the insecticide, fungicide and rodenticide law of 1947 and provides for optional labeling. Registration is required annually, with no fees mentioned. This brings the Montana bill more nearly in line with the model bill.

New Mexico Senate Bill 168, which would amend the state's economic poisons law to increase annual registration fees from $2 to $10, has passed the senate and is before the House Committee on Irrigation and Drainage.

South Carolina is considering a new pesticides bill (Senate No. 100) to repeal the present pesticide law and enact a new one patterned after the uniform state and federal laws. It has been passed in the Senate and referred to the House Agriculture Committee. Features include 1.) A label statement of the name and percentage by weight of each active ingredient together with the total percentage by weight of the inert ingredients; 2.) Registration fees of $10 per brand for each of the first 20 registered and $5 each for brands in excess of 20. There are no registration fees under the present law; 3.) No provision for repealing the special disinfectant law which requires the registration and payment of registration fees for disinfectants.

Texas House Bill No. 457, which would amend the Texas Livestock Act, would require that a licensed, graduate veterinarian or a graduate chemist or a licensed pharmacist supervise the compounding or manufacture of any livestock remedy or insecticide that is offered for sale or distribution. The amendment would further require that the supervisor be on the premises at all times while the business is in operation and be in actual control of all manufacturing or formulation of livestock remedies and insecticides.

Washington Pesticides Bill—Senate No. 249—has been introduced and referred to the senate committee on agriculture and livestock. In general, the bill requires the licensing of all dealers in insecticides and herbicides and would impose record-keeping requirements. Washington recently announced that it has decided to accept labels that have been approved by the Federal Government for toxic pesticides.

Wyoming House Bill 168 has been amended in committee. It now states that "all provisions under the act regarding labeling as to formula content and caution statements shall conform with like federal requirements."

Originally, the paragraph called for the labeling of name and percentage of all active and inactive ingredients. It also originally provided that a caution statement appear on the label of all products which cannot be used generally in food establishments or on vegetation.

Of specific interest to the fertilizer trade, the state of North Carolina is considering a bill which would require all liquid fertilizers to be stored in containers meeting ASME standards for working pressure of 250 lbs./sq. in. Under the terms of the law, it would be illegal to sell such products in low pressure containers.

In addition, wholesale and retail distributors would be required to carry at least $10,000 insurance for each liability or furnish $20,000 bond. Before any proposed plant receives a final okay, the state department of agriculture would have to approve the plans and layout.

Index to ADVERTISERS

American Cyanamid Co. 28
American Agricultural Chemical Co. 80
American Potash & Chem. Corp. 112
Anderson, Carl N. 145
Andrews, W. R. E. Sales, Inc. 125
Antara Chemicals, Division of General Dyestuff Corp. 71
Armour & Co. 10
Ashcraft-Wilkinson Co. 14, 76
Atlas Powder Co. 6
Attapulgus Clay Co. 3

Baker H. J. & Bro. 62
Bagpak Division, International Paper Co. 64
Barber-Greene ..... Mar.
Baughman Mfg. Co. ..... Mar.
Bemis Bro. Bag Co. ..... 3rd Cover
Berkshire Chemicals, Inc. 146
Berkeley Chemical Corp. ..... Mar.
Black Products Co. 142
Butler Mfg. Co. ..... Mar.

Calcium Carbonate Corp. 100
California Spray Chem. Co. 116
Chase Bag Corp. 58
Chemagro Corp. 124
Chemical & Industrial Corp. ..... Mar.
Chemical Construction Corp. 56
Chem. Corp of Colorado 72
Cohutta Talc Co. 144
Columbia Southern Chemical Corp. 78
Combustion Engineering-Superheater, Inc., Raymond Pulverizer Div. 21
Continental Can Co., Betner Div. 118
Cox, Dr. Alvin J. 147

Davies Nitrate Co., Inc. 142
Davison Chemical Corp. 90
de Ong, Dr. E. R. ..... Mar.
Diamond Alkali Co. 18
Dings Magnetic Separator Co. 146
Dorr Co. 74
Dow Chemical Co. 104
du Pont de Nemours & Co., E. I. 11, 66, 67
Duval Sulphur & Potash Co. 76

Eastman Chemical Products, Inc. 17
Edco Corp. 134
Ethyl Corp. 51-54

Floridin Co. 8
Fry Co., Geo. H. 139
Fulton Bag & Cotton Mills ..... Mar.

Geigy Co. 114
General Chemical Division, Allied Chemical & Dye Corp. 86
General Industrial Development Corp. Mar.
Georgia Talc Co. 140
Glendon Pyrophyllite Co. 141
Goodrich Chemical Co., B. F. ..... Mar.
Greeff & Co., R. W. ..... Mar.

Hammond Bag & Paper Co. ..... Mar.
Heckathorn & Co. 138
Highway Equipment Co. ..... Mar.
Hercules Powder Co. ..... 4th Cover
Huber, J. M. Corp. ..... Mar.
Hudson Pulp & Paper Corp. 68

International Clay Co. 67

Jaite Co. ..... Mar.
Johns-Manville Co. ..... Mar.
Johnson, C. S. Co. ..... Mar.

Kolon Trading Co., Inc. 144
Koppers Co. 136
Kraft Bag Co. 22

Lancaster, Allwine & Rommel 146
Lion Oil Co. 16

Marietta Concrete Corp. 146
Dr. C. C. McDonnell 145
Marathon Corp. 102
Mathieson Agricultural Chemicals Co. Mar.
McLaughlin Gormley King Co. 127
Mente & Co. 134
Michigan Chemical Corp. 70
Monsanto Chemical Co. 12, 81

National Agricultural Chemicals Ass'n. 132
National Aniline Division, Allied Chemical & Dye Corp. 23
Naugatuck Chemical Division, U. S. Rubber Co. 27
Niagara Chem. Div. Food Machinery & Chem. Corp. 96
Ninol Laboratories, Inc. 69
Nitrogen Division, Allied Chemical & Dye Corp. ..... Feb.
Nopco Chemical Co. 130

Pacific Coast Borax Co. 128
Penick, S. B. & Co. ..... Mar.
Pennsylvania Industrial Chemical Corp. 87
Pennsylvania Salt Manufacturing Co. 60
Phelps Dodge Refining Corp. 131
Philgo Chemical & Products Corp. 123
Phillips Chemical Co. 98
Pioneer Chemical Associates 129
Pioneer Pyrophyllite Corp. 142
Pittsburgh Agricultural Chemical Co. a Division of Pittsburgh Coke and Chemical Co. 20
Pittsburgh Plate Glass Co., Corona Division 122
Potash Company of America ..... 2nd Cover
Poulsen, A. E. & Co. 133
Powell, John & Co. 9
Prentiss Drug & Chemical Co. 138
Private Brands, Inc. 147

Raymond Pulverizer Division, Combustion Engineering-Superheater, Inc. 21
Republic Steel Corp. 7
Riedeburg, Theodore Associates 145
Rodgers, George G. Co. 144
Richardson Scale Co. ..... Mar.
Rohm & Haas Co. 75

Southeastern Clay Co. 144
Spencer Chemical Co. 26
Spraying Systems Co. 140
Shell Chemical Co. 82
Standard Agricultural Chemicals, Inc. 92
Stauffer Chemical Co. 101
Sturtevant Mill Co. ..... Mar.

Tennessee Corp. 91
Tennessee Products & Chemical Corp. 24
Texas Gulf Sulphur Co. 120
Thompson, Friar M. 145
Thompson-Hayward Chemical Co. 126
Titlestad, Nicolay Corp. ..... Jan.
Tobacco By-Products & Chemical Corp. 88
Townsend, Dr. G. R. 145

Union Bag & Paper Corp. 4
Union Special Machine Co. 25
United Chemical Co. 138
Union Standard & Equipment Co. 144
U. S. Industrial Chemicals Co. 106
U. S. Potash Co. 94
U. S. Steel Corp. 73

Vanderbilt Co., R. T. 19
Velsicol Corp. 79
Virginia-Carolina Chemical Corp. 88

Whittaker, Clark & Daniels, Inc. ..... Mar.
Williams Patent Crusher & Pulverizer Co. 13
Willingham Little Stone Co. 142
Willson Products Inc. 145
Wilson Organics, Inc. 137
Wisconsin Alumni Research Foundation 140
Woodward & Dickerson, Inc. ..... Mar.
Worthington Corp. 15
Woudhuysen, H. L. & Associates 136
Wyandotte Chemicals Co. ..... Dec.

Young Machinery Co. 142

Zonolite Co. 110

The industry meeting calendar, usually found on this page, appears on page 109 this month.

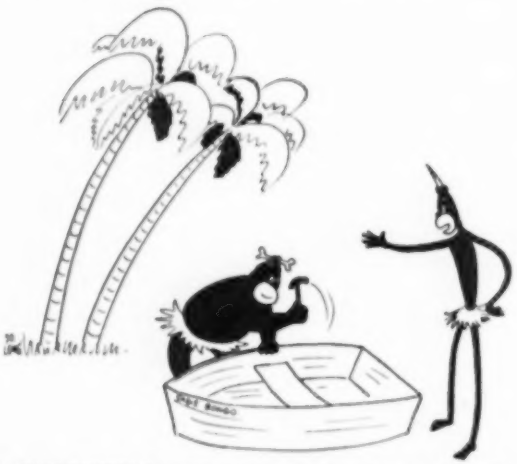
(The Advertisers' Index has been checked carefully but no responsibility can be assumed for any omission)

Tale Ends

DID you send change of address, or a new subscription recently and nothing happened? This may explain it. Our changes are sent out each month to be placed on Addressograph plates. The whole bundle of March changes was lost, and our service company cannot locate them. In the meantime our subscription girls are laboriously trying to retrieve all the original material from the files to set up the changes all over again. Some may be missed. So please be patient. Duplicate instructions would help.

That Louis Bromfield's Malabar Farm may soon be transformed into a farm experiment foundation was indicated recently by the author's daughter, Mrs. Ellen B. Geld. She is reported to have said in a letter that the farm will be renamed "Mary A. Bromfield Foundation," in honor of the late Mrs. Bromfield who died last year. Foundation funds may provide agricultural scholarships for those who qualify, it was suggested. "Malabar Farm will remain for all time a place to work, learn and try new ideas," the letter said.

Beautiful, But...



ADVERTISING in the wrong place is no advertising at all. Only if it is read by the right people can it do any good. Now, if you want it to be read by the right people in the field of chemicals for agricultural use, the right place is

AGRICULTURAL CHEMICALS

175 FIFTH AVE. NEW YORK 10, N. Y.

Member Audit Bureau of Circulations

C. R. Kiphart, safety supervisor, Phillips Chemical Co., Borger, Texas, speaker at the recent Southern Safety Conference at Atlanta, Ga., journeys around the country to some extent, but he didn't start traveling anywhere until he was practically a young man.

He explained to a group of fertilizer men at the meeting, that he was more than 15 years of age before he ever saw a railroad train. The family was "sitting out" a homestead in Oregon during his early years, and the location was about as desolate as anyone could imagine. A hundred miles to the nearest town meant that any trip to it was a major undertaking and the family bought its groceries and other supplies by the year.

Upon noting the congestion in the modern cities of America, Mr. Kiphart looks back over his uncrowded childhood with no particular misgivings. He said that he had a "wonderful time" as a boy.

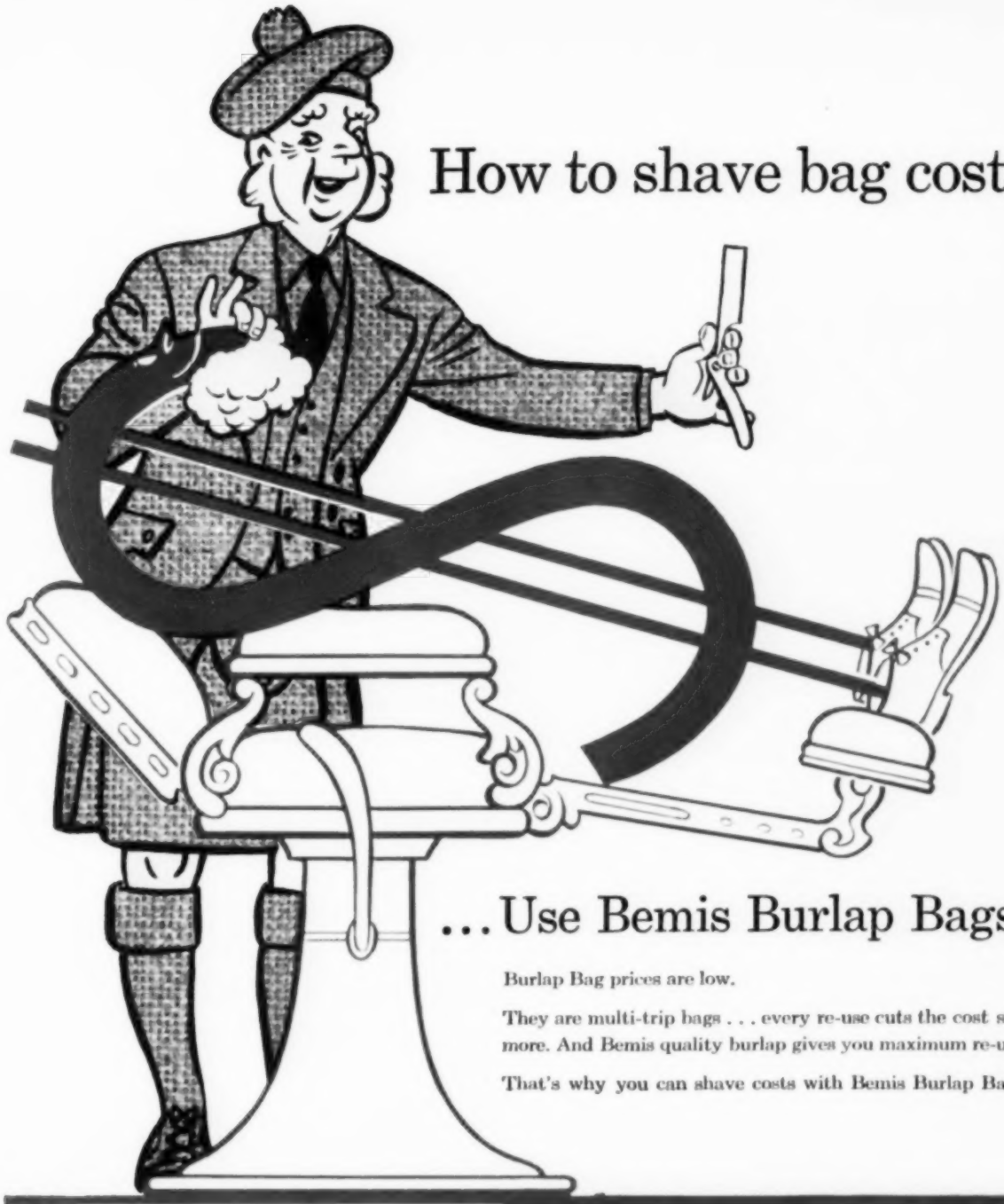
•

"Turkey to Make Fertilizer," is a headline in a daily paper. Looks like even the animals are experiencing new competition. Let the cows look to their laurels!

•

A note in April *Veg-News* published by Cornell University, discusses soil conditioners in its April 1 issue. The paper's comment says "Surprising as it may seem, some recent experiments have shown that improved yields do not always follow improved soil condition."

—From Davison Chemical Corp.



How to shave bag costs

...Use Bemis Burlap Bags!

Burlap Bag prices are low.

They are multi-trip bags . . . every re-use cuts the cost still more. And Bemis quality burlap gives you maximum re-use.

That's why you can shave costs with Bemis Burlap Bags.

P. S. Supplies are excellent, too. The jute situation overseas shows you can base your long-term plans on burlap.

Bemis

BEMIS BRO. BAG COMPANY

General Offices—St. Louis 2, Mo.
Sales Offices in Principal Cities

TOXAPHENE *kills* INSECT PESTS

Toxaphene dusts or sprays are approved for the control of an increasing number of harmful insects. All those listed above are included in latest recommendations. For specific information on toxaphene (chlorinated camphene 67-69% Cl), write to the manufacturer . . .

Naval Stores Department *HERCULES POWDER COMPANY* *970 Market St., Wilmington 99, Del.*

NX52-29